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Motivational Interventions to Reduce Alcohol Use in a Military
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14. ABSTRACT
The overriding objective of this research was to reduce hazardous drinking in a military sample by implementing two motivational interventions and comparing them to a treatment-as-usual (substance abuse awareness seminar) condition. Personnel referred to the Air Force Alcohol and Drug Abuse Prevention and Treatment (ADAPT) program as the result of an alcohol incident or who were self-referred were consented and then randomly assigned to one of three interventions: (1) group motivational interviewing (GMI), (2) individual motivational interviewing (IMI), or (3) a substance abuse awareness seminar (SAAS) group. Participants provided data regarding drinking and related problems at baseline and at 3, 6, and 12 months following the baseline. Analyses focused on (1) determining the effectiveness of the interventions in reducing alcohol use and alcohol-related problems, (2) testing factors that may mediate or moderate responses to the interventions, and (3) determining the cost of treatment. Results indicated that the IMI was the most effective in reducing substance use. In addition, the average implementation costs were highest for SAAS ($148 per client), followed by IMI ($84) and GMI ($70). Finally, increased heavy episodic drinking at baseline predicted a more negative outcome at 3-month follow-up.

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military personnel, alcohol abuse, alcohol abuse intervention, motivational interviewing

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Introduction and Objectives

Alcohol abuse has been a long-standing problem in the military. The armed services have experienced problems with alcohol from the earliest days of military service, in part because heavy drinking has been an accepted custom and tradition (Bryant, 1979; Schuckit, 1977). In the past, alcohol was thought to be necessary for subsistence and morale and, as such, was provided as a daily ration to sailors and soldiers. In the predominantly male U.S. military population, heavy drinking has served as a test of "suitability for the demanding masculine military role" (Bryant, 1974, p. 133), and hard-fighting soldiers have commonly been characterized as hard-drinking soldiers. Alcoholic beverages have been available to military personnel at reduced prices at military outlets and, until recently, during happy hours on base (Bryant, 1974; Wertsch, 1991). In addition, alcohol has been used in the military to reward hard work, to ease interpersonal tensions, and to promote unit cohesion and camaraderie (Ingraham, 1984).

This study sought to assess empirically the effectiveness of two motivational interventions compared with treatment as usual (TAU) in the Air Force Alcohol and Drug Abuse Prevention and Treatment (ADAPT) program. Follow-up assessments were conducted at 3, 6, and 12 months post-baseline. In addition, the study established cost-effectiveness indices for these interventions, providing the Department of Defense (DoD) with valuable information that will support policy and funding decisions. Findings from this study provide information on potential interventions for use by DoD as part of its alcohol abuse reduction initiative. Specifically, the data will help inform alcohol abuse prevention strategies targeting heavy-drinking personnel. Our findings will also have important implications for DoD's efforts to develop comprehensive plans for treating alcohol abuse among military personnel. Finally, our results will help identify avenues for further investigation. Four major objectives guided this study:

- Evaluate the short- and long-term effectiveness of two motivational interventions with heavy-drinking military personnel. We tested the effects of a motivational intervention delivered individually and in a group format to determine whether group motivational interviewing (GMI) can produce outcomes similar to those demonstrated with individual motivational interviewing (IMI).
- Compare GMI and IMI with a TAU control group. Results will provide information on the effectiveness of the current Air Force substance abuse awareness seminar (SAAS) in comparison to two experimental conditions.
- Test factors that may mediate or moderate responses to the interventions. These interventions are promising strategies to reduce harmful drinking in that they may trigger the change process (i.e., problem recognition, concern about drinking, and a desire to change drinking behavior). The assessment portion of the interventions included measures of factors to be tested as mediators. Knowledge of the change process offers a better understanding of how motivational interviewing (MI) may lead to behavioral change. A number of individual-level factors may also interact with the interventions to attenuate responses. These factors are included in the design as potential moderators of the interventions' effectiveness. Factors that moderate effectiveness will help identify populations for whom the interventions work.

- Assess the cost and cost-effectiveness of the three interventions. The cost-effectiveness analysis provides an estimate of the additional costs, relative to SAAS, of achieving a given improvement in effectiveness using either of the MI approaches. The results from this analysis will allow decision makers to make fully informed treatment resource allocation decisions by weighing gains in effectiveness against any additional cost.

An evaluation of outcomes will provide a clearer understanding of the approach with the greatest benefit for military drinkers and the factors that mediate or moderate the intervention. The research includes a large sample and an extended follow-up on intervention effects, components that most previous intervention studies have lacked. From a practical perspective, the ability to classify which individuals will benefit from a motivational intervention has important implications for military readiness and alcohol policy.

Body

Background

Almost 200,000 new personnel are recruited into active duty military service each year, entering a force numbering about 1.4 million (DoD, 1999). Young recruits have many of the same issues and problems experienced by civilian young adults. In the civilian population, the 18 to 25 age group has the highest prevalence rates of heavy alcohol use and tobacco use (Substance Abuse and Mental Health Services Administration [SAMHSA], 2003). These high rates among civilian young adults may be exacerbated among military personnel, who are away from family and other social supports and who are facing the stresses of military life, including working in high-risk environments. Indeed, prevalence rates of heavy alcohol use are significantly higher among military personnel than among civilians, particularly for males and younger enlisted personnel (Bray et al., 1999).

Alcohol use among military personnel is implicated in lowered work performance, accidents and injury, and serious problems with others and the law. These factors detract from military readiness. According to research conducted by RTI International on behalf of DoD, heavy alcohol use (defined in military studies as drinking five or more drinks per typical drinking occasion at least once a week) decreased slightly between 1980 and 1998, from 21% to 19%; nonetheless, it remains at problem levels and is particularly common among young enlisted personnel (Bray et al., 1999). High rates of heavy drinking are found among military personnel with a high school education or less (24%), those aged 20 or younger (24%), those aged 21 to 25 (26%), unmarried personnel (24%), and junior enlisted personnel (26%). In 1998, 7% of military personnel experienced serious consequences from their alcohol use, 14% experienced productivity loss, and 5% could be defined as dependent on alcohol. Negative effects associated with alcohol use were more common among heavy drinkers than less frequent drinkers. For example, compared with moderate drinkers, heavy drinkers were more likely to experience serious consequences from alcohol use (24% vs. 4%), productivity loss (39% vs. 9%), and symptoms of dependence (22% vs. 1%).

Since 1972, DoD has been establishing prevention and treatment policies to confront alcohol abuse and alcoholism among military personnel (DoD, 1972, 1980, 1983, 1985, 1994, 1997). In 1986, these directives were combined with broader ones to form a comprehensive health promotion policy that recognized the value of good health and healthy lifestyles for military performance and readiness (Bray, et al., 2003; DoD, 1994). Under this policy, DoD directed programs toward preventing the misuse of alcohol, providing counseling or rehabilitation services to abusers, and providing education to various target audiences (Bray et al., 1995). The DoD Prevention, Safety, and Health Promotion Council (DoD, 1999) put forward a broad-based initiative to address the substantial impact of alcohol use on the military. The strategic plan seeks to reduce heavy alcohol use, promote a responsible alcohol use lifestyle and culture, promote alcohol alternatives, and deglamorize alcohol use.

An important target group for education and enforcement of DoD alcohol abuse policies is young adult personnel. Heavy alcohol use is common among young adults in the civilian

population, from whom military recruits are drawn. Findings from the 2002 National Household Survey on Drug Abuse (NHSDA) indicate that about 38% of young adults aged 18 to 25 were binge drinkers (i.e., drank five or more drinks per occasion on at least 1 day in the previous 30 days) and 13% were heavy drinkers (drank five or more drinks per occasion on 5 or more days in the previous 30 days) (SAMHSA, 2003). Both binge drinking and heavy drinking were relatively stable among young adults during the 1990s, although both increased significantly between 1997 and 1998. Heavy drinking was particularly common among young adult males (47%), Whites (43%), those with a college education (41%), and those employed full-time (41%). Heavy drinking decreased between 1999 and 2000 for those in college (from 43% to 41%) but was stable among other young adults (34%).

Research suggests that brief interventions can be effective with young adult populations (Anderson et al., 1998; Bien, Miller, & Tonigan, 1993; Marlatt et al., 1998; Miller, 2000; Monti et al., 1999). A brief intervention for alcohol use is typically defined as minimal interaction with a medical or mental health professional, focusing on the health risks associated with drinking and ranging from several minutes to several sessions. Brief interventions are particularly effective for individuals who do not have severe alcohol dependence but are drinking at harmful levels—the target population for this research. Thus, brief interventions are a cost-effective way of providing services to a greater number of individuals while saving more intensive efforts for those requiring such treatment (Dimeff et al., 1999).

One of the most successful brief interventions used to date has been motivational interviewing (Zweben & Zuckoff, 2002; Butler et al., 1999). MI is conceptualized as a style of therapeutic interaction that has at its core the belief that individuals are responsible for changing their (drinking) behavior and for sustaining the changed behavior (Miller & Rollnick, 1991). Because MI includes techniques that allow the individual to explore ambivalence about changing and techniques that avoid triggering defensive behaviors, this approach is particularly useful for people who are reluctant to change and/or are ambivalent about changing. MI-based approaches have demonstrated effectiveness in young adult samples (Marlatt et al., 1998; Miller, 2000; Monti et al., 1999). Because heavy-drinking military personnel are likely to be in the 18 to 25 age group, we believe that a motivational intervention may be effective in reducing abusive drinking behaviors in this population.

Although decision makers often find it necessary to weigh the costs required to achieve any gains in effectiveness, there is little existing published research that can be used for guidance. There is no published evidence on the cost-effectiveness of GMI. Moreover, there is no published evidence on the cost and cost-effectiveness of similar prevention interventions conducted in the Air Force. Therefore, to help policy makers allocate treatment resources within the Air Force, a rigorous cost-effectiveness analysis of these treatment alternatives compared with TAU is necessary.

Tasks Associated with the Statement of Work

RTI was awarded this contract on March 1, 2004.

Task 1: Obtaining Study Approvals

Prior to funding, a protocol for the protection of human subjects for the study was submitted to the Institutional Review Board (IRB) at RTI International. Final approval was given by the RTI IRB on January 20, 2004.

Following the RTI IRB approval process, the protocol and documentation materials were prepared for the Air Force Wilford Hall Medical Center (WHMC) IRB review. During this time, our Air Force contact in the Surgeon General's Office, Maj. (Lt. Col) Paul Wilson was promoted and transferred and Maj. Christine Hunter became our contact person. Dr. Brown traveled to Major Hunter's office on July 13, 2004 to brief her on the study and its objectives and to review the WHMC IRB materials for submission. Maj. Hunter suggested a few revisions, which were incorporated into the final set of materials submitted to WHMC on August 2, 2004. Maj. Hunter and Dr. Brown traveled to San Antonio, TX to be present for the IRB review of the study and to answer questions from the committee. On August 24, 2004 WHMC provided approval for the study.

On September 17, 2004, we submitted IRB materials, including the RTI and Air Force IRB approvals, to the Ft. Detrick's Human Subjects Research Review Board (HSRRB) for review and approval (HSRRB Log No. A-12529, Proposal No. PR033142, Cooperative Agreement No. DAMD 17-04-1-0072).

Unfortunately, the IRB protocol was not reviewed by the Ft. Detrick HSRRB for 5 months (i.e., not until February 2005). This delay was *not* the fault of the research team; all materials had been provided, and multiple e-mail and telephone contacts inquiring about the status of the review failed to yield any information. The Memorandum for Review (MFR) was e-mailed to Dr. Brown on February 14, 2005.

On April 12, 2005, a response to the initial review of the protocol was submitted to the Fort Detrick HSRRB for review and approval (HSRRB Log No. A-12529, Proposal No. PR033142, Cooperative Agreement No. DAMD 17-04-1-0072). RTI received comments on these revisions on June 9, 2005, and resubmitted the protocol with the additional revisions as requested on June 24, 2005. Fort Detrick responded on July 15, 2005, with a request for additional materials, which were remitted to Fort Detrick the same day. Final approval for Phase I of the study was obtained for the Fort Detrick HSRRB on July 19, 2005.

Final approval for Phase I of the study was obtained from the RTI IRB on January 20, 2004, from the WHMC IRB on August 24, 2004, and from the Fort Detrick HSRRB on July 19, 2005. Approval for Phase II of the study was obtained from the RTI IRB on November 4, 2005, from the WHMCIRB on January 27, 2006, and from the Fort Detrick HSRRB on May 4, 2006.

Task 2: Prepare MI Training Manuals, Intervention Manuals, Study Protocol Manual, and Computer Assessments. Prepare for Tape Coding.

A Motivational Interviewing Training Manual was developed to train ADAPT staff in the basic principles of MI. The manual includes modules for practicing MI skills and components. The book *Motivational Interviewing* by Miller and Rollnick (1991) and a series of videotapes

were mailed to each of the participating bases for use during the MI training session. Training took place across 3 days at each of the study sites. A Group MI Training Manual and an Individual MI Training Manual were developed for training ADAPT personnel in the specific treatment conditions for the study. A project manual documenting all aspects of the study including protocols to be followed was completed in December 2004 and a copy was given to each participating base. The training manual and two intervention manuals can be found in Appendix A.

The primary source of data for participants was the standardized assessment provided by the ADAPT programs. The Substance Abuse Assessment Tool (SUAT) was rolled out to all Air Force bases in 2005 and was onsite at the study bases once data collection began. The SUAT is a comprehensive assessment from which the study team will request specific variables. Another component of the baseline assessment included a Web-based assessment covering items not asked in the standard SUAT. This computerized assessment was finalized in January 2005.

In December 2004, Dr. Brown and Ms. Council traveled to the Center on Alcoholism, Substance Abuse and Addictions (CASAA) in Albuquerque, NM, for intensive supervision training for maintaining treatment integrity. In addition, Ms. Council traveled to Santa Fe, NM, in February to receive training in tape coding.

Task 3: Conduct MI Training of ADAPT Staff, Recruit Air Force Bases

Installation issues have been a major obstacle in attaining the goals of this project. Originally working with Maj. Hunter, we initially recruited three Air Force bases to participate in the study: Tinker AFB in Oklahoma, Eglin AFB in Florida, and Offutt AFB in Nebraska. We added RAF Lakenheath to the study during Year 2. Working with Maj. Frazier, who replaced Maj. Hunter, we added Travis AFB and Sheppard AFB in Year 3 During the course of the study, three installations withdrew because of time and staffing constraints (Tinker AFB during Year 2, RAF Lakenheath and Travis AFB during Year 3) leaving us with three installations collecting data: Eglin, Offutt, and Sheppard.

RTI conducted MI training for ADAPT staff and study personnel at six Air Force installations: Eglin AFB and Tinker AFB in April 2005, Offutt AFB in May 2005, RAF Lakenheath in October 2005, Travis AFB in September 2006, and Sheppard AFB in June 2007. The training included skills needed for the administration of the two MI treatment groups (IMI and GMI), as well study procedures and requirements.

Task 4: Pilot Assessment

We conducted a brief pilot test of the Web-based assessment during the site visits for training and corrected any issues arising from accessing the survey and moving through the questions.

Task 5: Participant Recruitment

On January 2, 2006, recruitment for study participants began at Eglin AFB, Offutt AFB, and RAF Lakenheath. As of March 17, 2006, we had 28 participants enrolled in the study (5 at Eglin AFB, 16 at Offutt AFB, and 7 at RAF Lakenheath). As of March 26, 2007, we had 132

participants enrolled in the study (40 at Eglin AFB, 72 at Offutt AFB, and 20 at RAF Lakenheath). Data collection was initiated at Sheppard AFB in September 2007. As of March 4, 2008, we had 261 participants enrolled in the study (84 at Eglin AFB, 87 at Offutt AFB, 70 at Sheppard AFB, and 20 at RAF Lakenheath). Of the 261 total participants, 129 were enrolled in Year 4. Enrollment across intervention conditions is roughly equal, with 75 in GMI, 81 in IMI, and 96 in TAU. Final enrollment into the study was 313.

Due to staffing issues, enrollment was significantly lower than expected. Specifically, at Eglin AFB, the program manager (PM) of the ADAPT program left that position, and it has been challenging to engage the new PM. Also at Eglin, a new program for ADAPT patients (i.e., Alcohol Brief Counseling) has been initiated, and we are competing for non-diagnosed patients. At Offutt AFB, the PM left the position and was replaced, delaying enrollment. In addition, the new PM at Offutt AFB deployed for 6 months during 2007, and in that time the program, which had previously been one of our most active sites, enrolled only seven individuals. After we had trained the staff at Travis AFB, the PM left the installation for a new assignment and the new PM was not interested in being part of the study.

Task 6: Booster Training for MI Counselors and Tape Coders

Motivational interviewing booster training was conducted for ADAPT staff and study personnel at Eglin AFB (in November 2005, June 2006, December 2006, and June 2007) and at Offutt AFB (in December 2005, June 2006, and April 2007). Sheppard AFB was added as a study site and MI training was conducted there in June 2007, and booster training was conducted in December 2007. The training and booster training included reinforcing skills needed for administering the two motivational interviewing conditions (IMI and GMI), as well as study procedures and requirements.

To maintain treatment integrity throughout Phase I and across installations, IMI and GMI treatment sessions were audiotaped and rated for MI adherence. During Year 2, RTI personnel were trained in the use of the motivational interviewing treatment integrity (MITI) and motivational interviewing skill coding (MISC) tape coding scales.

Tasks 7, 9, 10: Follow-Up Assessment

During Year 2, the questionnaire for the 3-, 6-, and 12-month follow-up survey was developed, finalized, and programmed for Web access. The follow-up questionnaire was accessed by participants via a Web link that was sent to them in an e-mail message at approximately 3, 6, and 12 months from the completion of their treatment group (IMI, GMI, or TAU). The follow-up rate for this study is low overall due to incorrect e-mail addresses, nonresponse from participants, and/or personnel moving to new installations or deploying. Every participant received the original e-mail requesting that they complete the follow-up plus two reminder e-mails.

Phase II (i.e., follow-up) data collection commenced April 18, 2006. As of March 26, 2007, 74 follow-up surveys had been completed (44 3-month, 29 6-month, and 1 12-month). As of March 4, 2008, 162 follow-up surveys had been completed (83 3-month, 50 6-month, and 29

12-month). As of March 4, 2009, 249 follow-up surveys had been completed (108 3-month, 89 6-month, and 52 12-month).

Task 12: Presentations and Publications

A number of presentations have resulted from this research effort. Selected results are summarized below. See Appendix B for the full copy of all poster presentations.

Brown, J. M. and Rae Olmsted, K. (2008, January). *Group and individual motivational interventions with Air Force personnel*. Poster presented at the Alcohol Policy 14 Conference, San Diego, CA.

- Both IMI and GMI resulted in significant decreases in the number of drinking days in the past month.
- Only the IMI condition produced a significant decrease in the percentage of binge drinking days.
- All three intervention conditions produced significant reductions in the average number of drinks per drinking occasion and in the total number of drinks during the heaviest drinking occasion.
- Those who were married/living as married were less likely than those who were never married to report heavy drinking.
- Those who were married or living as married more likely to report drinking on 5 or more days in the past month.
- Participants who reported having a blood relative with an alcohol problem were more likely to report heavy drinking and binge drinking.

Brown, J. M. & Bender, R. H. (2009, September). *Group and individual motivational interventions with Air Force personnel: Comparisons with an educational intervention.* Poster presented at the Military Health Research Forum, Kansas City, MO.

Three outcome variables were examined: binge drinking days, average drinks per drinking episode, and maximum drinks in a drinking day.

- All three intervention conditions produced significant reductions in the average number of drinks per drinking occasion and in the total number of drinks during the heaviest drinking occasion.
- Only the IMI condition produced a significant decrease in the percentage of binge drinking days.
- Only the IMI condition produced a significant decrease in the maximum number of drinks on a heavy drinking day.
- Tests for treatment effects on baseline and 3-month follow-up drinking behavior and changes in drinking behavior between baseline and follow-up data collection revealed the following:
  - There were no differences among the three groups at baseline on drinking measures.

- o At 3-month follow-up, binge drinking in the IMI group was lower than in both the GMI (p=.014) and TAU (p=.024) groups.
- o Consistent with this, the drop in binge drinking between baseline and follow-up was greater in IMI than in TAU (p=.044).
- o We also found the drop in maximum drinks between baseline and follow-up was greater in IMI than in TAU (p=.037).
- Further analyses examining the effect of moderators tested interaction effects between the treatment group variable and the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES) scores for Taking Steps, Problem Recognition, and Ambivalence, with the following significant result:
    - o Problem Recognition was a significant moderator of the treatment effect (GMI vs. TAU, p=.047) on the change in binge drinking between baseline and follow-up. Analyses investigating whether change in Desire, Confidence, or Importance post-intervention was associated with the change in drinking behavior between baseline and follow-up found *no significant associations*.

One article has been submitted and another will be submitted upon final internal review. See Appendix D for copies of both articles.

Cowell, A., Brown, J. M., Wedehase, B. J., & Masuda, Y. J. (submitted). The costs of using motivational interviewing for problem drinking in the U.S. Air Force. *Military Medicine.*

This article presents estimates of the costs of starting up and implementing an MI intervention for problem drinking in an Air Force setting. There are three additional broad contributions to the literature. First, by presenting costs for a provider that is not a physician, the current estimates help expand the MI cost literature to settings that present opportunities to intervene in problem drinking. Second, separately estimating start-up costs from implementation costs is important because, in addition to the magnitude of costs, decision makers need to understand the structure and timing of costs. Like most other settings in society, the military has relatively scarce treatment resources and must prioritize and plan appropriately. Budgets can be adjusted accordingly for starting a new program, such as an MI intervention. For example, a rough estimate of the cost of training three new staff members in MI at Base C was $8,787. This estimate was obtained by adding the fixed component of the cost, which is the trainer, travel, and space at $4,704 ($899 + $3,446 + $359), to the variable component, which is the time of the staff at $4,083 (3 x $1,361 per staff member). A third contribution is that the study recognizes that the military underwrites the resources used by staff and clients when addressing problem drinking. Client costs are critical because they may represent barriers to treatment in some settings (depending on Air Force and base policy) and in certain settings—such as at some military bases—they are a real cost to the employer. Employers should understand what resources must be foregone by requiring personnel to attend treatment rather than perform regular duties.

Key Research Accomplishments

This section briefly notes in bulleted format the research accomplishments achieved under the grant. These accomplishments included the following:

- Developed briefing materials and presented briefings to key personnel and base command personnel to build support for the study.
- Recruited three bases to be in the study.
- Obtained letters of support from base commanders at each installation.
- Established base-level points of contact as the ADAPT program managers.
- Developed training and intervention manuals for the project.
- Purchased computers, training tapes, tape recorders, and MI books for the three Air Force bases to be included in the study.
- Scheduled training at all three bases.
- Obtained final clearance for Phase I (baseline) from the Fort Detrick HSRRB.
- Obtained final clearance for Phase II (follow-up) from the RTI and WHMC IRBs.
- Submitted Phase II (follow-up) protocol to the Fort Detrick HSRRB for approval.
- Conducted MI trainings at Eglin AFB, Tinker AFB, Offutt AFB, Travis AFB, Sheppard AFB, and RAF Lakenheath.
- Trained tape coding staff in the use of the MITI and MISC rating scales for motivational interviewing.
- Conducted booster MI training at all participating bases.
- Edited and cleaned data from the baseline survey and 3-, 6-, and 12-month follow-up surveys.
- Presented study progress or results at briefings, meetings of military research groups, and professional conferences. A full list of briefings and presentations is included in the "Reportable Outcomes" section.
- Generated two manuscripts for submission to peer-reviewed publications focusing on data collected as part of this project and tobacco data from other military datasets. One manuscript has been submitted for publication; a completed draft has been prepared for the other manuscript. This manuscript will be finalized and submitted to a peer-reviewed journal within the next month.

Reportable Outcomes

Briefings and Symposia

- Brown, J. M. (2008, June). *Motivational interventions to reduce alcohol use in a military population.* Presented at the Air Force Community Prevention Division Research Meeting, San Antonio, TX.
    - Community Prevention Division Research Meeting
      San Antonio, TX
      June, 2007
    - Community Prevention Division Research Meeting
      San Antonio, TX
      December, 2006
    - Community Prevention Division Research Meeting
      San Antonio, TX
      June, 2006
    - Community Prevention Division Research Meeting
      San Antonio, TX
      December, 2005
    - Community Prevention Division Research Meeting
      San Antonio, TX
      June, 2005
    - Community Prevention Division Research Meeting
      San Antonio, TX
      December, 2004
    - Community Prevention Division Research Meeting
      San Antonio, TX
      June, 2004
    - Community Prevention Division Research Meeting
      San Antonio, TX
      June, 2003
- Cowell, A., & Brown, J. M. (2008, December). *Interventions to reduce alcohol use in a military population: Cost analyses.* Presented at the Air Force Community Division Research Meeting, San Antonio, TX.
    - Community Prevention Division Research Meeting
      San Antonio, TX
      June, 2007
    - Community Prevention Division Research Meeting
      San Antonio, TX
      June, 2006
- Brown, J. M., & Bender, R. M. (2009, September). *Group and individual motivational interventions with Air Force personnel.* Symposium presented at the Military Health Research Forum, Kansas City, MO.

- Brown, J. M. (2008, June). *Individual and group motivational interventions: Effectiveness with Air Force personnel*. Symposium presented at the annual Research Society on Alcoholism meeting, Washington, DC, June 2008.
- Cowell, A. J., & Matsuda, Y. (2007, October) *Motivational interventions to reduce alcohol use in a military population: Cost and effectiveness.* Paper presented at the Addiction Health Services Annual Research Meeting, Athens, GA.

Poster Presentations

- Brown, J. M. & Bender, R. H. (2009, September). *Group and individual motivational interventions with Air Force personnel: Comparisons with an educational intervention*. Poster presented at the Military Health Research Forum, Kansas City, MO.
- Brown, J. M., & Rae Olmsted, K. (2008, January). *Group and individual motivational interventions with Air Force personnel*. Poster presented at the Alcohol Policy 14 Conference, San Diego, CA.
- Rae Olmsted, K., Brown, J. M., & Hunter, C. (2006, May). *Group MI for military members.* Presented at the Military Health Research Forum, San Juan, Puerto Rico.

Publication under Review

- Cowell, A., Brown, J. M., Wedehase, B .J., & Masuda, Y. J. (submitted). The costs of using motivational interviewing for problem drinking in the U.S. Air Force. *Military Medicine.*

Publications under Internal Editorial Review

Two publications have been prepared: one is currently under internal editorial review and one will be ready for internal editorial review within the next month.

- Brown, J. M. & Bender, R. H. (to be submitted). Heavy episodic drinking and associated problems among military personnel. *Journal of Alcohol and Drug Education.*

- Brown, J. M., Bender, R. H., & Cowell, A. (to be submitted). Group and individual motivational interventions with Air Force personnel. *Journal of Studies on Alcohol and Drugs.*

Conclusions

This study sought to assess empirically the effectiveness of two MI interventions compared with treatment as usual (Substance Abuse Awareness Seminar, SAAS) in the ADAPT program. We evaluated the short- and long-term effectiveness of two motivational interventions with heavy-drinking military personnel. We tested the effects of MI delivered individually and in a group format to determine whether a GMI produced outcomes similar to those demonstrated with an IMI.

Preliminary data indicate that all three interventions resulted in decreased alcohol use, but both the IMI and GMI produced better outcomes (i.e., lower number of drinks) at the 3-month follow-up than the SAAS that was offered to Air Force personnel during the study period. These findings are tempered by a low follow-up rate. However, analyses revealed that those not completing follow-up assessments were no different from those who provided follow-up data on any of the alcohol use variables. The results are particularly exciting as this is one of the first true tests of a GMI and we were able to demonstrate that it is possible not only to do MI in a group format, but to produce results similar to those found with IMI.

We also examined risk and protective factors for alcohol use and were able to determine that being married is protective against binge drinking and that individuals with a family history of alcohol problems are at the highest risk for binge drinking.

One moderator of the treatments was found. When problem recognition coming into treatment is low, GMI has a larger effect on dropping binge drinking than SAAS. When problem recognition is high, GMI does not have distinguishable effects from SAAS on binge drinking. This suggests that GMI may have its greater efficacy in reducing binge drinking through raising the level of problem recognition. Unfortunately, we did not have a post-intervention measure of problem recognition to confirm this.

We also conducted research to estimate of the costs of starting up and implementing MI in an Air Force setting. The start-up cost at each base varied from approximately $1,340 to $2,400 per interventionist. Average implementation costs were highest for SAAS ($148 per client), followed by IMI ($84 per client) and GMI ($70 per client). The highest start-up cost (at more than $16,000) was almost twice that of the lowest (at nearly $9,000). Because training took a similar length of time across all sites, this variation was driven by the pay grade and the number of staff being trained. If ADAPT programs are operating at capacity, those in command of resources may not be able to affect either of these factors in the short term, but decisions about which staff are trained and which are not can certainly be made in the longer term. Pay grade also affects implementation costs. For example, the staff cost per session—which is borne solely by the Air Force—of implementing GMI at three bases was between $23 and $29 per client. At the fourth base, the session cost was only $9, primarily because the intervention was delivered by staff of a lower pay grade. Decision makers will need to balance these cost considerations against the benefits of using more qualified, experienced staff to deliver the interventions.

There are three additional broad contributions to the literature. First, by presenting costs for a provider that is not a physician, the current estimates help expand the MI cost literature to settings that present opportunities to intervene in problem drinking. Second, separately estimating start-up costs from implementation costs is important because, in addition to the magnitude of costs, decision makers need to understand the structure and timing of costs. Like most other settings in society, the military has relatively scarce treatment resources and must prioritize and plan appropriately. Budgets can be adjusted accordingly for starting a new program, such as an MI intervention. For example, a rough estimate of the cost of training three new staff members in MI at Base C was $8,787. This estimate was obtained by adding the fixed component of the cost, which is the trainer, travel, and space at $4,704 ($899 + $3,446 + $359), to the variable component, which is the time of the staff at $4,083 (3 x $1,361 per staff member). A third contribution is that the study recognizes that the military underwrites the resources used by staff and clients when addressing problem drinking. Client costs are critical because they may represent barriers to treatment in some settings (depending on Air Force and base policy) and in some settings—such as at some military bases—they are a real cost to the employer. Employers should understand what resources must be foregone by requiring personnel to attend treatment rather than perform regular duties.

Implications of Research Findings

Alcohol use is a major health and readiness issues in the U.S. military, especially for junior enlisted personnel. Alcohol use among military personnel is implicated in lowered work performance, accidents and injury, and serious problems with others and the law. Substance abuse experts in the Air Force and throughout the military need to have a good understanding of why personnel use alcohol, and which state-of-the-art interventions have been shown to be effective, in order to better target both the timing and method of programs to intervene with personnel who receive a mandate for a substance abuse assessment.

This study suggests that brief interventions can be effective in this population. Both IMI and GMI were more effective than an educational session in reducing alcohol use and consequences at follow-up. There are a number of additional steps that the military may take in reducing alcohol use and problems: (1) screen recruits for alcohol use history and strongly encourages those who are regular drinkers to stop or reduce their use before entering the military; (2) encourage military leaders during basic training to clearly communicate that personnel should moderate their drinking when they enter the regular force; (3) strive to create the impression among junior enlisted personnel that the military considers heavy alcohol use to be a problem and that the military is actively trying to do something about it; and (4) provide tested, proven alcohol reduction programs during basic training and afterwards; (5) reduce drinking among military leaders—or at least reduce the perception among junior enlisted personnel that their military leaders drink heavily; and (6) reduce the stigma surrounding seeking treatment for substance abuse problems so that more personnel will seek help when they need it.

References

Anderson, B. K., Larimer, M. E., Lydum, A. R., & Turner, A. P. (1998). *Prevention of alcohol problems in college Greek systems*. Poster presented at the conference for the American Psychological Association.

Bien, T. H., Miller, W. R., & Tonigan, J. S. (1993). Brief interventions for alcohol problems: A review. *Addiction, 88,* 315-336.

Bray, R. M., Hourani, L., Rae, K. L., Dever, J. A., Brown, J. M., Vincus, A. A., Pemberton, M. R., Marsden, M. E., Faulkner, D. L., & Vandermaas-Peeler, R. (2003). *2002 Department of Defense survey of health related behaviors among military personnel*. Report prepared for the U.S. Department of Defense. Research Triangle Park, NC: RTI International.

Bray, R. M., Kroutil, L. A., & Marsden, M. E. (1995). Trends in alcohol, illicit drug, and cigarette use among U.S. military personnel: 1980–1992. *Armed Forces & Society*, *21,* 271–293.

Bray, R. M., Sanchez, R. P., Ornstein, M. L., Lentine, D., Vincus, A. A., Baird, T. U., Walker, J. A., Wheeless, S. C., Guess, L. L., Kroutil, L. A., & Iannacchione, V. G. (1999, March). *1998 Department of Defense Survey of health related behaviors among military personnel: Final report* (RTI/7034/006-FR, prepared for the Assistant Secretary of Defense [Health Affairs], U.S. Department of Defense, under Cooperative Agreement No. DAMD17-96-2-6021). Research Triangle Park, NC: Research Triangle Institute.

Bryant, C. D. (1974). Olive-drab drunks and GI junkies: Alcohol and narcotic addiction in the U.S. military. In C.D. Bryant (Ed.), *Deviant behavior* (pp. 129-145). Chicago, IL: Rand McNally.

Bryant, C. D. (1979). *Khaki-collar crime*. New York: Free Press.

Butler, C., Rollnick, S., Cohen, D., Russell, I., Bachmann, M., & Stott, N. (1999). Motivational consulting versus brief advice for smokers in general practice: A randomized trial. *British Journal of General Practice, 49,* 611-616.

Department of Defense. (1972, March). *Directive No. 1010.2: Alcohol abuse by personnel of the Department of Defense*. Washington, DC: Department of Defense.

Department of Defense. (1980, December 5). *Instruction No. 1010.5: Education and training in alcohol and drug abuse prevention.* Washington, DC: Department of Defense.

Department of Defense. (1983, August 10). *Directive No. 1010.7: Drunk and drugged driving by DoD personnel* (available on-line at http://web7.whs.osd.mil/text/d10107p.txt). Washington, DC: Department of Defense.

Department of Defense. (1985, March 13). *Instruction No. 1010.6: Rehabilitation and referral services for alcohol and drug abusers* (available on-line at http://web7.whs.osd.mil/text/i10106p.txt). Washington, DC: Department of Defense.

Department of Defense. (1994, December 9). *Directive No. 1010.1: Military personnel drug abuse testing program* (administrative reissuance 1999, January 11; available on-line at http://web7.whs.osd.mil/text/d10101p.txt). Washington, DC: Department of Defense.

Department of Defense. (1997, September 3). *Directive No. 1010.4: Drug and alcohol abuse by DoD personnel* (administrative reissuance 1999, January 11, and available on-line at http://web7.whs.osd.mil/text/d10104p.txt; 1010.4 supersedes and cancels August 25, 1980, version of Directive No. 1010.4 and September 23, 1985, version of Directive No. 1010.3). Washington, DC: Department of Defense.

Department of Defense, Prevention, Safety, and Health Promotion Council. (1999, April 2). *1999 Alcohol abuse prevention strategic plan*. Washington, DC: Author.

Dimeff, L. A., Baer, J. S., Kivlahan, D. R., & Marlatt, G. A. (1999). *Brief Alcohol Screening and Intervention for College Students (BASICS): A harm-reduction approach*. New York: Guilford Press.

Ingraham, L. H. (1984). *The boys in the barracks*. Philadelphia, PA: Institute for the Study of Human Issues.

Marlatt, G. A., Baer, J. S., Kivlahan, D. R., Dimeff, L. A., Larimer, M. E., Quigley, L. A., Somers, J. M., & Williams, E. (1998). Screening and brief intervention for high-risk college student drinkers: Results from a 2-year follow-up assessment. *Journal of Consulting and Clinical Psychology*, *66*, 604-615.

Miller, W. R. (2000). Rediscovering fire: Small interventions, large effects. *Psychology of Addictive Behaviors, 14,* 6-18.

Miller, W. R., & Rollnick, S. (1991). *Motivational interviewing: Preparing people to change addictive behavior*. New York: Guilford.

Monti, P. M., Colby, S. M., Barnett, N. P., Spirito, A., Rohsenow, D. J., Myers, M., Woolard, R., & Lewander, W. (1999). Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology*, *67*, 989-994.

Schuckit, M. A. (1977). Alcohol problems in the United States armed forces. *Military Chaplain's Review: Alcohol Abuse,* pp. 9-19.

Substance Abuse and Mental Health Services Administration. (2003). *Results from the 2002 National Survey on Drug Use and Health: National Findings* (Office of Applied Studies, NHSDA Series H-22, DHHS Publication No. SMA 03-3836). Rockville, MD.

Wertsch, M. E. (1991). *Military brats: Legacies of childhood inside the fortress*. New York: Harmony Books.

Zweben, A., & Zuckoff, A. (2002). Motivational interviewing and treatment adherence. In W. R. Miller & S. Rollnick (Eds.), *Motivational interviewing: Preparing people to change* (2nd ed., pp. 299-319). New York: Guilford Press.

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APPENDIX A:
TRAINING AND INTERVENTION MANUALS

MOTIVATIONAL INTERVIEWING TRAINING

MOTIVATIONAL INTERVENTIONS TO REDUCE ALCOHOL USE IN A MILITARY POPULATION

June 2007

Janice M. Brown
RTI International

MI TRAINING – AIR FORCE GROUP MI PROJECT

I.   Introductions

II.   What is MI?

III.   Prochaska and DiClementi - Stages of Change

IV.   Discuss pending change

V.   Rate self and partner on SOC

VI. Am   bivalence

VII. Roadblocks   and Traps

VIII. Reflective   listening

IX. Reflections

X. Resistan   ce

XI. Self   -Motivational Statements

What is MI?

- A directive, client-centered counseling style for eliciting behavior change by helping people to explore and resolve ambivalence.

- Useful for people who are reluctant to change.

- Seeks to create a positive atmosphere.

The Spirit of Motivational Interviewing

- Motivation to change comes from the person
- The individual must resolve ambivalence
- Direct persuasion is not effective
- The interaction style is a quiet one
- The counselor helps examine ambivalence
- Readiness to change fluctuates

Spirit of MI is:

- respectful of the individual and her/his freedom to choose

- facilitating value clarification

- sort of Zen-like, moving with the individual, uses an open & accepting stance

- very strategic, listening for opportunities for self-motivational statements

- demanding for both participants

- believing that the client is the expert on her/his life and needs

- focused on therapeutic indifference or detachment (no real investment in whether it "works"

- a profound optimism that people can change

- de-emphasis on labeling

- knowing that ambivalence is normal

- egalitarian; working <u>with</u> the person, not "fixing" them

- a focus on meaning and understanding; getting into the client's reality

- believing that there are positives of not changing

- not blaming

- genuinely affirmative and not adversarial (joining, along side, guide)

- highlighting the implications of behaviors and increasing behavioral options

- a grounding of behaviors in the environmental context (client's reality)

Basic Tenets of Motivational Interviewing:

- Motivation is the probability that a person will enter into, continue, and adhere to a specific change strategy.

- Motivation is a state of readiness or eagerness to change, which may fluctuate from one time or situation to another. This state is one that be influenced.

- Motivation for change does not reside solely within the client. Motivation involves an interpersonal context.

- Therapist style is a powerful determinant of client resistance and change.

- People struggling with addictive problems often have fluctuating and conflicting motivations, also known as ambivalence. Ambivalence is normal, not pathological.

- Each person has a powerful potential for change. The task of the therapist is to release that potential to facilitate the natural change process already inherent in the individual.

- Motivational interviewing involves helping people resolve the ambivalence that entraps them.

STAGES OF CHANGE

PROCHASKA, DiCLEMENTI, & NORCROSS

Stages of Change
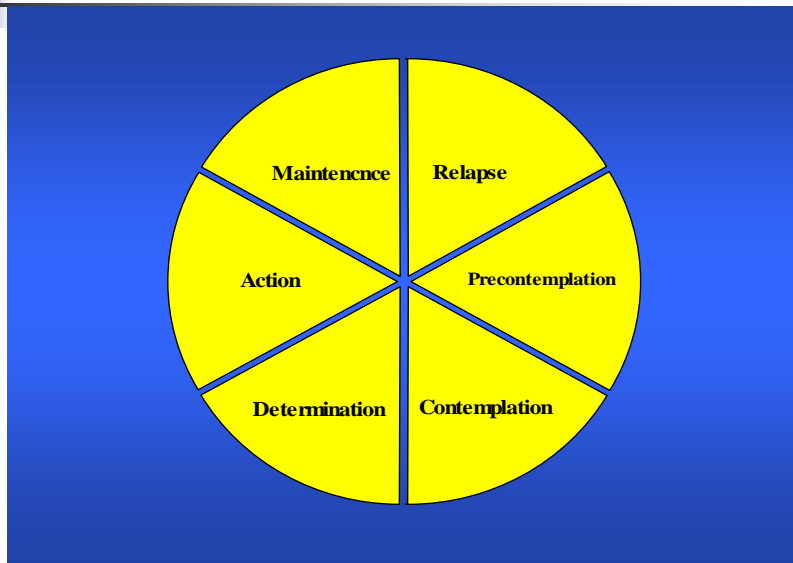
Precontemplation Stage

- No intention to change
- Usually coerced
- May change due to "pressure" but once pressure is off goes back to "old ways"
- It isn't that they can't see the solution. It is that they can't see the problem

TASK: Help them to see there is a problem.

- Raise doubt
- Increase client's perception of the risks and problems with current behavior
- Decrease defensiveness
- Increase personal realization

Contemplation Stage

- Aware of the problem
- Aware of some of the negative effects of the problem
- Know where they want to go but unwilling to take action <u>yet</u>
- Willing to change in the next 6 months

TASK: Tip the balance in favor of the benefits of behavior change

- Elicit reasons for change, risks of not changing
- Strengthen the client's confidence for changing current behavior
- Encourage a commitment to a change attempt
- Resolve ambivalence
-

Preparation/Determination Stage

- Have tried to make changes unsuccessfully in the past
- Intent to change within the next month

TASK: Negotiate a plan with the client

- Help client to determine the best course of action
- Work on developing a plan for change
- Strengthen commitment

Action Stage

- Have actually taken a step to change behavior
- Are very committed to change
- May not have completely accomplished the behavior change

TASK: Support the person and strengthen action if necessary

- Help client identify necessary steps to implement the plan for change
- Help the client use skills and problem solve
- Support the client's confidence in making the change
- Help client identify additional resources that may be helpful

Maintenance Stage

- Have successfully made change for at least 6 months
- Can express the many positive aspects of the change

TASK: Support and continue to monitor

- Help client identify potentially tempting situations and develop strategies to prevent relapse
- Help client resolve associated problems
- Affirm client's commitment and efforts to change
- Ask about the positive benefits the client has noticed since changing behavior

Relapse

- Patient frequently feels shame and guilt
- Reluctant to see counselor because of failure
- May feel hopeless

TASK: Support and help devise new plan

- Help client identify what led to relapse
- Help client to develop a plan for dealing with trouble spots

Appropriate Motivational Strategies for Each Stage of Change (adapted from CSAT TIP #35)

Precontemplation Goals: Help person engage in counseling process and begin considering patterns and potential effects of their substance use	• Establish rapport, build trust • Explore and "decontaminate" the referral process • Affirm clients for willingness to attend and talk • Explore the meaning of events that brought the client to treatment • Elicit the client's perceptions of their behaviors and the larger situation • Offer factual information about the risks of substance use • Provide personalized feedback about assessment findings • Explore the good things and less good things about substance use • Express concern and "keep the door open"

Contemplation
 	
Goals: Help person see the "big picture," discover discrepancies between their current behavior and their goals for the future, and consider making some lifestyle changes
	• Normalize ambivalence
	
	• Help the client tip the decisional balance scales toward change by:
	   • Eliciting and weighing the pros and cons of continuing substance use versus discontinuing or changing use patterns
	   • Examining the client's personal values in relation to change
	   • Imagining the future
	   • Emphasizing the client's free choice, responsibility, and self-efficacy for change
	
	• Elicit self-motivational statements of intent and commitment from the client
	
	• Elicit ideas regarding the client's expectations regarding treatment
	
	• Summarize self-motivational statements
	
	• Assess client's sense of importance and confidence in changing

Appropriate Motivational Strategies for Each Stage of Change (adapted from CSAT TIP #35)

Preparation Goals: Help person resolve ambivalence about changing, develop a sense of ability to change, and make initial plans for going about changing	• Clarify the client's own goals and strategies for change • Develop a menu of options for change • With permission, offer expertise and advice • Help the client develop a change plan • Assist the client in decreasing barriers to change (e.g., financial, child care) • Ask client to consider announcing plan to change ("going public") • Help client to identify and plan for high-risk situations and other negative aspects of change
Action Goals: Help person initiate change, cope with difficulties in the change process, and gain social support for new ways of being	• Support small steps toward change • Acknowledge difficulties and losses involved in change • Assist the client in finding new reinforcers of positive change • Help client access and use social support • Identify current triggers • Help client cope with unanticipated negative "side-effects" of changing • Emphasize that setbacks and lapses are unintended failures of planning process and help improve long-term plan • Generate additional change strategies
Maintenance Goals: Help person cope with difficult situations, maintain commitment and energy, initiate new facets of living to protect against relapse, and process through relapses that occur	• Affirm client's resolve and self-efficacy • Maintain contact and reaffirm appropriateness of seeking support • Assist client in making the transition to working on other long-term goals • Express willingness to assist client in event of setback or relapse

AMBIVALENCE

Understanding Ambivalence

- Ambivalence as the heart of the problem
- Attachment to the behavior
- Approach-Avoidance conflict
- The decisional balance

Many people experience little or no serious conflict about whether to have a drink, enter a lottery, or eat fattening food; they are in a state of balance or equilibrium. Other people experience severe conflict about engaging versus resisting – this is ambivalence.

Attachment to the behavior occurs in many ways. One process is pharmacological dependence, another is tolerance, and yet others may be learning or conditioning. People may also use addictive behaviors as a means of coping. They come to rely on a drink to help them deal with difficult states.

Approach-avoidance conflicts have a special potential for keeping people "stuck" and creating stress. Here the person is both attracted to and repelled by a single object. "I can't live with it, and I can't live without it."

A helpful way of illustrating the ambivalence conflict involves the metaphor of a balance or seesaw. The person experiences competing motivations because there are both benefits and costs associated with both sides of the conflict. This is not to imply that clients are always (or even usually) aware of this balancing process, or that when they are made aware, they will proceed toward making rational decisions. For both the client and the counselor, ambivalence can be confusing, frustrating, and difficult to understand.

Working with Ambivalence

- Response to ambivalence is critical
- Ambivalence is not rational

Clients will vary in the extent to which they have understood their ambivalence. This is how far the person has progressed into the contemplation stage.

As a counselor, you should be careful not to jump too far ahead.

Pressuring a person to make a change in drinking is jumping too quickly – a recipe for resistance.

As ambivalence is understood and worked through, the person moves closer to determination and decision making.

4 Reasons Why People Are Ambivalent About Changing

- Behaviors seem to "work"

- Behaviors seem "normal"

- Patients are accustomed to passive role

- Seems to hard to change

- Additional reasons…

REFLECTIONS

Exercise: Reflective Listening 1

BEFORE STARTING TO SHAPE REFLECTIVE LISTENING IT CAN BE USEFUL TO INCREASE AWARENESS OF THE IMPORTANCE AND VALUE OF NONVERBAL (PASSIVE) LISTENING SKILLS.

Exercise: Reflective Listening 2

LEARNING TO "THINK" REFLECTIVELY

THERE IS A WAY OF THINKING THAT ACCOMPANIES GOOD REFLECTIVE LISTENING. IT INCLUDES, OF COURSE, INTEREST IN WHAT THE PERSON IS SAYING AND RESPECT FOR THEM. THE KEY ELEMENT IS A HYPOTHESIS TESTING APPROACH TO LISTENING. WHAT YOU <u>THINK</u> THEY MEAN MAY NOT BE WHAT THEY MEAN.

DO YOU MEAN THAT...?

Exercise: Reflective Listening 3

THE QUESTIONS ASKED IN THE LAST EXERCISE WERE CLOSE TO REFLECTIVE LISTENING, BUT NOT QUITE.

A GOOD REFLECTIVE LISTENING RESPONSE IS A STATEMENT. IT GOES DOWN AT THE END.

> YOU'RE ANGRY ABOUT WHAT I SAID?
> YOU'RE ANGRY ABOUT WHAT I SAID.

SOME PEOPLE LIKE TO HAVE SOME WORDS TO GET THEM STARTED.

> SO YOU FEEL...
> IT SOUNDS LIKE YOU...
> YOU'RE WONDERING IF...
> YOU...

Listen Reflectively

- Crucial element is how one *responds*
- Make a guess as to what the person *means*
- Should be formed as a <u>statement</u>
- Questioning distances the person from the experience
- Reflection is not passive

Perhaps the most challenging skill in motivational interviewing is that of reflective listening. In popular conceptions, listening just involves keeping quiet and hearing what someone has to say. The crucial element in *reflective* listening is how the counselor *responds* to what the client says.

In order to offer reflective listening, you first must train yourself to *think* reflectively. To think reflectively is to make the process more conscious. Reflective listening is a way of checking, rather than assuming that you know what is meant.

Reflection is not a passive process. The counselor decides what to reflect and what to ignore, what to emphasize and de-emphasize, what words to use in capturing meaning. Reflection is particularly important following open-ended questions.

ROADBLOCKS and TRAPS

Thomas Gordon's 12 Roadblocks

1.Ordering Directing	2. Warning Threatening	3. Advice Suggestion
4. Persuading Arguing	5. Moralizing Preaching	6. Judging Criticizing
7. Agreeing Approving	8. Shaming Ridiculing	9. Interpreting Analyzing
10. Reassuring Sympathizing	11. Questioning Probing	12. Distracting Humoring

It is not *wrong* to use roadblocks, but they are not listening and tend to divert the client. Thus, they are best minimized when reflective listening is the purpose. To listen well is to avoid the roadblocks and to do something else.

Traps to Avoid

- Question-Answer Trap
- Confrontation-Denial Trap
- Labeling Trap
- Expert Trap
- Premature Focus Trap
- Blaming Trap

Question-Answer
- May be the result of anxiety
- Teaches the patient to give short answers
- It implies interaction between an active expert and a passive patient
- As a rule, avoid asking 3 questions in a row

Confrontation-Denial
- The most important trap to avoid
- Leads to a power struggle
- Increases resistance
- Common in early phases

Labeling
- May be an issue of control
- Evokes unnecessary resistance
- No need to actively *oppose* self-acceptance
- Emphasis is not to get into debates and struggles over labels

Expert
- Conveys the impression of having all the answers
- Edges patients into a passive role

Premature Focus
- Not uncommon to want to hone in on alcohol/drug use and problems
- Patients may need to explore other problems
- Avoid struggles about what to focus on
- Start with patient's concerns

Blame
- Blame is irrelevant
- Wastes time and energy on defensiveness

RESISTANCE

Resistance

- Arguing
- Interrupting
- Defensiveness
- Ignoring

Strategies for Coping with Resistance

- Reflective Responses
    - Simple reflection
    - Amplified reflection
    - Double-sided reflection

- Strategic Responses
    - Shifting focus
    - Emphasizing personal choice and control
    - Agreeing with a twist

THINGS THAT DON'T WORK

- Nagging
- Preaching
- Talking and not listening
- Telling the person what to do
- Labeling the client
- Getting involved in power struggles

THINGS THAT WORK

- Listen
- Acknowledge affect (don't try to change how the person feels)
- Express empathy
- Develop discrepancy
- Avoid arguments
- Roll with resistance
- Anticipate problems
- Support and praise positive efforts no matter how small

ELICITING SELF-MOTIVATIONAL STATEMENTS

PROBLEM RECOGNITION - THE CLIENT EXPRESSES RECOGNITION OF PROBLEMS OR DIFFICULTIES.

    WHAT MAKES YOU THINK THAT THIS IS A PROBLEM?
    WHAT DIFFICULTIES HAVE YOU HAD IN RELATION TO YOUR DRUG USE?
    IN WHAT WAYS HAS THIS BEEN A PROBLEM FOR YOU?

CONCERN - THE CLIENT VOICES PERSONAL CONCERN FOR HIS OR HER CONDITION, HEALTH, FAMILY, ETC.

    WHAT WORRIES YOU ABOUT YOUR DRINKING?
    HOW MUCH DOES THAT CONCERN YOU?
    WHAT DO YOU THINK WILL HAPPEN TO YOU IF YOU DON'T MAKE A
        CHANGE?

DETERMINATION - THE CLIENT INDICATES WILLINGNESS, DESIRE, COMMITMENT, OR A DECISION TO CHANGE.

    WHAT ARE THE REASONS YOU SEE FOR MAKING A CHANGE?
    WHAT MAKES YOU THINK YOU MAY NEED TO MAKE A CHANGE?
    WHAT WOULD BE THE ADVANTAGES OF MAKING A CHANGE?

OPTIMISM - THE CLIENT INDICATES HOPEFULNESS OR OPTIMISM.

    WHAT ENCOURAGES YOU THAT YOU CAN CHANGE IF YOU WANT TO?
    WHAT DO YOU THINK WOULD WORK FOR YOU, IF YOU DECIDED
        TO CHANGE?

ONCE THE PROCESS HAS BEGUN, KEEP IT GOING WITH "AND WHAT ELSE?" STATEMENTS.

INDIVIDUAL MOTIVATIONAL INTERVIEWING
TREATMENT MANUAL

AIR FORCE MI PROJECT

Revised 12/2007

INDIVIDUAL MOTIVATIONAL INTERVIEWING MANUAL

The purpose of the session is to discuss health habits and lifestyles that might be causing problems for the individual.

<u>Staying with the spirit</u>. There will be times a therapist may not feel he/she is following the motivational approach to the letter. Some deviations will be necessary, but the key is for you to keep and model the spirit of the motivational approach by truly believing in an individual's ability to make a change, and by attending to the individual with skillful reflective listening. Rather than confronting clients for not taking the your viewpoint, therapists can present information and encourage clients to use it in their decision making process. Continually reinforcing the idea that "change is up to you" will allow clients to address their ambivalent feelings about change, rather than becoming defensive.

I. Welcome and Introduction (Time: 2 minutes)

- Welcome the participant and introduce yourself.
- Remind them that the session will be tape recorded but that their name will not be associated with the tape and no Air Force personnel will have access to it. Immediately following the session, the tape recording will be sealed in a mailer and sent to RTI.

II. What to expect from the Session (Time: 3-5 minutes)

The key task here is to orient the participant to the MI intervention and what to expect from the session:

- You'll be spending anywhere from 45 to 60 minutes with the participant.
- Stay with the spirit of MI by truly believing that the participant has the ability to make a change.
- Reinforce the idea that the change is up to them – let them know that you are not there to tell them what to do, that only they can decide that for themselves, but that you can help them as they explore the role that alcohol plays in their lives.
- Ask the participant for permission to talk with them about their alcohol use. You could say "*Can we spend some time talking about your alcohol use and explore the motivations you have for continuing to drink or perhaps to change?*"

III.   Opening strategies - Exploration of Lifestyles

The key task of the opening strategies is simply to **build rapport** and open the door to discussing the behavior change process. In general, this section is to give you an idea of what's going on with this person, how they use alcohol, and it serves to establish rapport because you will be using <u>reflections</u> and empathy.

- Start with: *First, I'd like to get an idea of what's going on with you.*

- *Let's talk a little about your lifestyle. How do you spend your free time? What are some of the things you enjoy doing*? Be sure to reflect, and to summarize at the end.

- Continue discussing until you feel you have a good idea of who this person is and then ask: *What about your use of alcohol? How does that fit in with your lifestyle*?

- State: *"A person's lifestyle can have effects on their health, mental health, financial security, relationships, and achievements."*

Use reflective listening throughout and summarize at the end, being careful not to interject your ideas or to try to convince them that there are other ways of accomplishing their goals.

IV.   Exploring Values and Strengths

1. Ask for definition of *Values*. Explain that sometimes, exploring our values can help us to shift the balance so that we are no longer ambivalent about a choice we need to make.

Hand the person the Values cards, then, have them choose their **5 or 6** most important values, then sort the cards from <u>most important</u> to <u>least important</u> value. Ask them to share their highest value, the one they ranked most important.

After this has been shared, say something like: *"Everyone has values, or standards they believe in. However, sometimes we act in ways that do not match our values, because we forget about them, we get tired, or we're distracted by other things."*

Then ask *"What gets in the way of living by your values? What would it take for you to live in a way that is closer to your most important values?"* asking how/if their actions are inconsistent with their highest value. Then ask for some ways in which they might live closer to their values. Spend a considerable amount of time processing this section.

2. You might make the following points:

- Not living up to our most important value might be a cost of use, and might add another reason to make a change.

- Living up to our most important value might be a benefit of change, again weighing in on the side of change.

- They may want to think about how they are living in line with their own values.

V. The Good and Not-So-Good Things

The purpose of this section is to begin to explore ambivalence – by having them understand that there are good and bad things about their alcohol use and therefore, reasons to use and reasons to quit.

Sometimes, we get into habits without ever really thinking about it. Sometimes, the habits are harmless, and other times, the habits can have consequences that we don't want. Today we are going to think about drinking and talk about the role that habit has played in your life. We are going to talk about the good things and not-so-good things about drinking. You might be surprised that I want to hear about the good things about using. But the truth is, nobody would drink if there were no good things about using alcohol, and we want you to be realistic about your choices. So let's begin.

This page shows two columns, with the headings "Good Things" and "Not-So-Good Things" on the top. Let's take a few minutes now, starting with the "good thing" and write down as many good things as you can.

When the participant is done, ask him/her to share the responses. Facilitate discussion of the "good things" topic. Encourage them to share experiences; the point here is to develop an understanding of the positive reasons for alcohol use, and the context of people's use.

Awareness of the Not-So-Good Things. Tell the person, "*Now we are going to look at another side of the picture*." On the right side of the page; list some of the "not-so-good things" about drinking. For example, you might list "have been arrested for drunk driving" or "have missed work" as "not-so-good things" about drinking.

Be careful to avoid labeling and help the participant refrain from labeling their own answers. If necessary, remind him/her that the purpose today is to develop a clear picture, of what alcohol use is like for them. There are no right and wrong answers to the exercise. Encourage discussion.

If it has not come up naturally, ask a variant on the following questions: *"Now that you are seeing both the good things and the not-so-good things about drinking, how are you reacting to this topic?* Also try similar exploratory questions that will help you judge whether they are becoming defensive. Explore the answers using reflective listening and summarizing skills. You may want to illustrate, perhaps summarizing as follows:

You might summarize some like this: *So, George, you enjoy drinking, especially when you're with your friends on the weekends while you work on your cars. Drinking seems to be a big part of hanging out with the guys, and you like the way everyone loosens up and jokes around while you're drinking. On the other hand, some not-so-good things are the way you feel late Sunday and Monday sometimes, the fights you get in with Darlene when you come home after drinking, and of course the DUI that brought you here. Is that about right?*

Exploring concerns. This is the "meat" of motivational counseling, when you will discuss the person's <u>ambivalence</u> about changing. Only when a participant indicates a concern should you proceed.

The typical opening question is "*What concerns do you have about your use of alcohol?*" The goal here is to explore then summarize the participant's concerns about their substance use behaviors, then to highlight the ambivalence by also summarizing the substance use's positive effects for the participant.

Ask them to give examples of each concern, to be sure you understand it. Lastly, summarize all the material covered in this strategy by acknowledging concerns one by one.

VI. Discussion of the Stages of Change

The primary task of this section is to **introduce the idea that change is a process**, that there are stages or steps that one goes through when deciding to make a change, and that each step has tasks or goals that help one to move on to the next step.

1. Explain the concept of change as a process that occurs over time in stages, it is not a single event. It is not like a light switch that has 2 positions – on/off – one doesn't just decide all of a sudden to change and then be changed. Even people who do things like quit smoking cold turkey go through these steps.

2. Understanding the process of change helps one to figure out what is needed at the different stages.

3. You might say: *The idea is that people seem to pass through similar stages as they work on making changes. This goes for many kinds of changes. The same stages seem to apply to people who want to lose weight as they do to people who want to cut down or stop their drinking. We talk about being "motivated" to change but motivation can be understood as a state of readiness that fluctuates.*

4. Sometimes the best example is the change they made when they decided to join the Air Force – there was a time before they thought about it – or said no way am I going in the military, then they considered it, then they decided to do it, then they may have started running or started telling people about it, and then, in maintenance, they had to fit into the way of life, change their behaviors, maintain a good record, etc.
        - one of the main points in this example is that maintenance <u>still</u> requires work.

The point to this section is to get them thinking about how people change and what gets in the way of changing.

NOTE: It is not necessary to go through each of the stages once to explain them and then a second time to use an example. Simply combine the example (joining the Air Force) – with an explanation of things "necessary" at each stage.

"<u>Pre-Contemplation Stage.</u>" *People in this stage typically need to have some type of additional information or experience some consequence before they move into the next stage.*

"<u>Contemplation Stage</u>." *During this stage people often both want change and yet want to stay the same at the same time. This can be a bit confusing for people as they feel torn between these options. In order to move forward with change, the scale has to be tipped toward change or else the person goes back to the first stage and convinces themselves that the behavior is not a problem.*

"Preparation or Determination stage." *During this stage, people begin thinking about how they can go about making the change they desire, they begin making plans, and then taking some action toward stopping old behaviors and/or starting new, more productive behaviors. People become more and more "ready" and committed to making change.*

 "Action Stage" people begin to implement their change plans and trying out new ways of being. *Often during this stage people let others know what's happening and look for support from them in making these changes.*

Once people have succeeded in making and keeping some changes over a period of time they enter the "Maintenance Stage." During this stage, people try to sustain the changes that have been made and to prevent returning to their old ways. This is why this stage is also known as the "Holding Stage" Many times the person is able to keep up the changes made and then makes a permanent exit from the wheel of change. *During this stage is also common for people to have some "slips" or "lapses" where old habits return for a short time.*

- Maintenance means monitoring
- It may require changing the action plan

VII. Pros and Cons of Changing

The goals of this activity are to increase awareness of <u>ambivalence about substance use</u> and to increase awareness of <u>ambivalence about change</u>.

- Discuss the fact that there are also good and bad things about changing.
- You will talk about the cons of changing and then the pros of changing

Summarize by stating something like, *"Motivation is influenced by how we view what we will gain and what we will lose by acting in different ways. Because most of the things we choose to do have both good and not-so-good things about them, we often experience <u>ambivalence</u> when we think about changing some of our habits.*

Ambivalence is a term that means you have mixed feelings about the same issue, and those different feelings are competing or in conflict with each other. When people are ambivalent, they have a harder time making decisions because nothing they do will meet all of their needs. One way to help this is to look at both sides of our feelings at the same time. "

When we think about making changes, most of us don't really consider all "sides" in a complete way. Instead, we often do what we think we "should" do, avoid doing things we don't feel like doing.

Look at your Good/Not so Good things about drinking. You could also think of this as reasons to stay the same (Good things) or as reasons to make a change (Not so Good things)

Ask them if there are additional reasons that they can think of for not changing

6

Then ask if there are additional reasons for changing.

For most people, "making a change" may mean quitting drinking altogether, but it is important that you consider what specific change you might want to make, which may be something else.

Helping with decision making. When it is clear that they have concerns and are ready to consider making a change, you can shift toward decision making by summarizing and asking "where does this leave you now?"

Listen carefully, and remember to stay in the listener role, rather than shifting into giving advice about HOW to change. Generally, the participant will show signs of decreased ambivalence, and may make several self motivational statements such as "I really want to change this problem now, but I'm not sure how to do it," indicating a desire to consider making a plan for change.

VIII. Planning For Change

You could say something like:

You were saying that you were trying to decide whether to continue or cut down...
After this discussion, are you more clear about what you would like to do?

- Start by telling them that the next topic is "*Successful Changes*." Ask what that means to them.

- You could ask the person for an example of a successful change.

  - Ask them to discuss the Stages of Change they cycled through.

  - Question the participant about their recollection of what helped and/or motivated him/her to change, using reflective listening skills.

  - Make the discussion as concrete and simple as necessary to help participants understand the abstract concepts.

  - Summarize by pointing out that they have the skills they need to make changes.

  - The evidence exists in the form of previous successful changes.

1. Tell them that they may now be ready to consider implementing an action plan for changing their drinking. Examples would include:

"Even though you have begun to make changes in your drinking, there may be some other things you haven't thought about or some things you can do to maintain those changes. "

   - Sometimes people will say – "I've already changed." You should reinforce that and ask what might happen if something gets in the way of those changes.

2. Give them the change plan worksheet. Allow time for completion, then ask the participant to share their plans. Be sure to reinforce at least one positive aspect of the plan, even if it is to say something like "I can tell you put a lot of thought into selecting a smaller

problem that would be easy to handle. Now you will have a method for solving even bigger concerns if you choose to."

Remind them that this activity can be done whenever they need to develop a plan to make a change, no matter how big or small. This exercise is a life skill that can be applied outside the group experience.

IX. Importance, Confidence, and Desire to Change

"You are here because you are either thinking of making a change in your alcohol use or because someone else believes that you may need to change. Sometimes the change is to quit using alcohol but that may not be the focus for you."

"I'm going to give you a paper with three scales for you to rate the importance of changing, your confidence in whether you can make changes, and how much you want to make a change in your alcohol use."

Distribute the Importance worksheet. Review the instructions on the sheet. After they have completed the sheet, review their responses. For each dimension (importance, confidence, desire), ask *"what makes your response a __, and not a 0? "* (assuming that their response wasn't a 0). This elicits a self-motivational statement that can be reflected or summarized.

Then ask, *"What might make you mark two higher on the scale?" (So* if the person has rated their importance 6, ask *"What might make you mark 8?').* This sensitizes you and the participant to events or concerns that can increase the participant's motivation to make a change.

For confidence, you could also ask, "*How can your family or friends help you increase your confidence (or desire) for making this change?"* Suggest that keeping these factors in mind while they implement their change plans can help to prevent setbacks.

For "desire," make sure to normalize feelings of dread if they are there. It is common for people to have negative feelings about making a change, even if they believe the change is important to make and they have strong confidence that they can achieve the intended change.

Remind them that making lasting changes often takes time and involves some setbacks. Take a few minutes to summarize your perceptions, and reflect on positive aspects that you have noticed (e.g., openness about vulnerable issues, determination to succeed, etc.). Ensure that the session ends on a positive note.
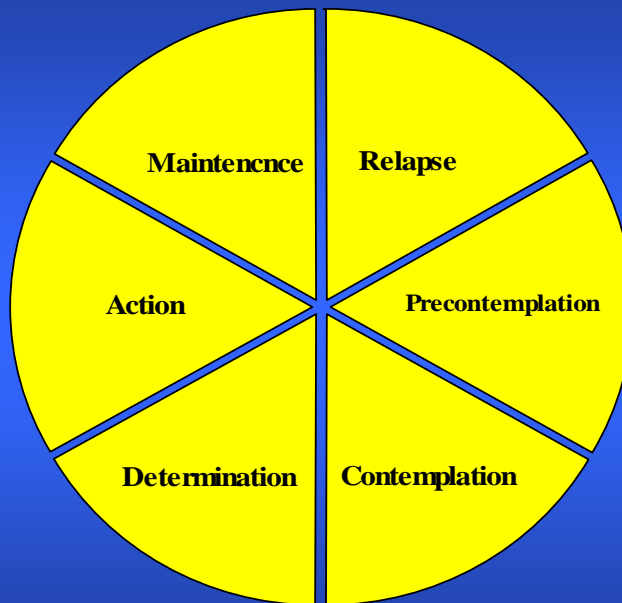
X. Ending the Session

Review follow-up expectations with the participant and remind them that they will be contacted at 3, 6, and 12 months for the web-based follow-up survey.

- End the session by stating that they are the best judges of what is right for them, and if they need to make a change.

- Give them a list of resources in your agency and area if they want to change and find they need more help.

- Remind the participant that we will be contacting them for follow-up in the coming months.

Stages of Change: Wheel Model

Stages of Change

Good things   **Not-So-Good things**

Change Plan Worksheet

The changes I want to make are:
The most important reasons why I want to make these changes are:
The steps I plan to take in changing are:
The ways other people can help me are:
I will know that my plan is working if:
Some things that could interfere with my plan are:

Importance, Confidence and Desire to Change

Most people are here because they are thinking about making a change, or because other people think they should make a change. Often, that change is to quit your use of alcohol altogether. However, that may not be the focus for you.

On the following 0 - 10 scale, please rate the importance <u>to you</u> of making a change in your drinking (or continuing to make a change that you've already begun). Please circle the number that most closely matches <u>the importance of this change to you</u>:

0   1   2   3   4   5   6   7   8   9   10

Not at all   *Most important*
Important   *thing in life*

Sometimes, even when goals or plans are important to us, we are still not sure if we can successfully achieve them. Please rate <u>your confidence</u> that you can successfully make (or maintain) the change in drinking you desire.

0   1   2   3   4   5   6   7   8   9   10

Not at all confident   *Completely confident*

Sometimes, even though we know a change is important and we are confident we can make it, we really aren't looking forward to making the change. Please circle the number that most closely matches <u>how much you want to make this change in your drinking</u>:

0   1   2   3   4   5   6   7   8   9   10

Dread making change   *Excited about the*
                                                                 making the change

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GROUP MOTIVATIONAL INTERVIEWING TREATMENT MANUAL

AIR FORCE MI PROJECT

Revised 12/2007

GROUP MOTIVATIONAL INTERVIEWING MANUAL

NOTE: The purpose of the group is to discuss health habits and lifestyles that might be causing problems for the group members. The group is not intended to be a process group, in which interactions between members are analyzed. Rather, members can provide feedback and support for each other as they consider lifestyle or habits that might need to change.

Staying with the spirit. There will be times a group leader may not feel he/she is following the motivational approach to the letter. Some deviations will be necessary, but the key is for the leader to keep and model the spirit of the motivational approach by truly believing in an individual's ability to make a change, and by attending to the members of the group with skillful reflective listening. Rather than confronting clients for not taking the group leader's viewpoint, group leaders can present information and encourage clients to use it in their decision making process. Continually reinforcing the idea that "change is up to you" will allow clients to address their ambivalent feelings about change, rather than becoming defensive.

I.   Introduction and Welcome
1. *Introduce yourself and go around the room and get first names of group members.*

2. *Remind them that the session is being tape recorded but that no identifiers will be included. No names will be associated with the tapes and no Air Force personnel will have access to them. They will be used only to ensure that they are getting the type of treatment they should be getting and for your (group leader) supervision.*

3. *Remind participants that all information shared in the discussion is confidential and must not be shared with persons outside the group.*

Respect that we are all here to learn from each other.

II.   What to expect from the group

Spend a few minutes orienting group members as to what to expect. This section is also one of the unique aspects of Group MI – raising awareness of disruptive group processes. It is also important that you, as the group leader, continue to monitor for these processes and interrupt or diffuse them as soon as possible. Go through the list of things below:

     1. We expect your full participation – I will want to hear your thoughts on the issues we raise today as well as your ideas about how you might go about making changes in your drinking.

     2. Things that sometimes get in the way of a good group discussion:

a. *Group Polarization – attitudes express themselves in multiple ways, such as by their importance, how accessible they are, and by how extreme they are. Individuals with extreme attitudes tend to believe that a larger proportion of others share one's own point of view. It is*

important to understand how expressing ideas in a group context can influence attitude formation. Group polarization means that a person's attitude toward a given issue tends to polarize (or shift) during a group discussion. Individuals revise their opinions as they learn that their beliefs differ from the opinion of outspoken members.

Young people commonly make statements like, "Everyone drinks in the military, but it doesn't get in the way of their job." or "I'm in great physical condition, so drinking doesn't affect my health." or "It's not fun to party unless you're drinking." It will be my job to fully explore these ideas with the group, because we do not want any group members to accept someone else's ideas without critically evaluating them.

NOTE: As the MI group leader, throughout the session you should explore each of the opinions being expressed, taking care to avoid argumentation. Provide the group an opportunity to critically evaluate statements – are they based in truth, does anyone hold a different opinion/attitude? Reiterate to the group that we want to hear everyone's thoughts on the issues we discuss and caution them to remember that there is no ONE approach to or attitude about the things we'll be discussing today.

b. <u>Social Loafing</u> *– the effect of the presence of others on individuals' attitudes and behaviors is well known. People are motivated by their expectations about the likely consequences of their actions. Often when people perform in groups they do <u>less</u> work or put in less effort than when they work alone. This probably happens because the responsibility placed on an individual diffuses with the presence of additional people. This is related to the idea that the more people there are present, the less likely anyone is to help someone in trouble.*

There may be less incentive to work hard on an activity, or contribute to a group when the probability of being singled out for insufficient performance is low – as the group size gets larger it is less likely a person will be called on. People may be content to allow other group members carry the weight of the discussion. When a person doesn't contribute, the risk is that they could disbelieve what someone else is saying without ever expressing an opinion to the group. That means that important issues may not get discussed.

Group members may also feel that their comments would simply be repeating what someone else said or that their ideas don't deserve attention from the groups. We can only have a full discussion if everyone has a say. Again, I'll be working to ensure that everyone contributes and has an opportunity to explore the topics. You all also have a responsibility for your contributions.

NOTE: As the group leader, it is important to remember that people will be less likely to worry about making redundant comments in an unconstrained environment. Also, group members may feel less apprehensive about being evaluated by others in a nonjudgmental environment. Finally, soliciting an individual's opinion will prevent that person from remaining detached from the discussion.

c. <u>Production Blocking or Free Riding</u> *Production blocking may also occur because the discussion goes so quickly that a person may forget their thoughts before having an opportunity to speak. In order to keep that from happening, they may rehearse their ideas while other speak but that then makes it difficult to hear and process comments from other group members. There will be a number of times today when we will be generating ideas or solutions and it is important*

to remember that the more ideas you can come up with, even ideas that seem wild, the better. One of the most important aspects of success in this group today will be the expression of thoughts and feelings. You are the critical resource for developing strategies needed to reduce hazardous drinking problems. We want to be sure we are not limiting ideas or promoting the belief that one's contributions are less important to the outcome.

III. Opening strategies - Exploration of Lifestyles

The key task of the opening strategies is simply to **build rapport** and open the door to discussing the behavior change process. In general, this section is to give you an idea of what's going on with all group members, how they use alcohol, and it serves to establish rapport because you will be using reflections and empathy.

- Start with: *First, I'd like to get an idea of what's going on with you all.*

- *Let's talk a little about your lifestyles. How do you spend your free time?*

- *What are some of the things you enjoy doing*? Be sure to reflect, and to summarize at the end.

- Continue discussing until you feel you have a good idea of who these people are is and then ask: *What about your use of alcohol? How does that fit in with your lifestyle*?

- State: *"A person's lifestyle can have effects on their health, mental health, financial security, relationships, and achievements."*

Use reflective listening throughout and summarize at the end, being careful not to interject your ideas or to try to convince them that there are other ways of accomplishing their goals.

IV. Exploring Values and Strengths

1. Ask for definition of *Values*. Explain that sometimes, exploring our values can help us to shift the balance so that we are no longer ambivalent about a choice we need to make.

Hand each person the Values cards, then, have them choose their **5 or 6** most important values, then sort the cards from most important to least important value. Ask them to share their highest value, the one they ranked most important.

After this has been shared, say something like: *"Everyone has values, or standards they believe in. However, sometimes we act in ways that do not match our values, because we forget about them, we get tired, or we're distracted by other things."*

Then ask *"What gets in the way of living by your values? What would it take for you to live in a way that is closer to your most important values?"* asking how/if their actions are inconsistent with their highest value. Then ask for some ways in which they might live closer to their values. Spend a considerable amount of time processing this section.

NOTE: Be sure to get information from all group members and summarize.

2. You might make the following points:

- Not living up to our most important value might be a cost of use, and might add another reason to make a change.

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> *Sometimes, we get into habits without ever really thinking about it. Sometimes, the habits are harmless, and other times, the habits can have consequences that we don't want. Today we are going to think about drinking and talk about the role that habit has played in your life. We are going to talk about the good things and not-so-good things about drinking. You might be surprised that I want to hear about the good things about using. But the truth is, nobody would drink if there were no good things about using alcohol, and we want you to be realistic about your choices. So let's begin.*

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 Awareness of the Not-So-Good Things. Tell the group, "*Now we are going to look at another side of the picture.*" On the right side of the page; list some of the "not-so-good things" about drinking. For example, you might list "have been arrested for drunk driving" or "have missed work" as "not-so-good things" about drinking.

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If it has not come up naturally, ask a variant on the following questions: *"Now that you are seeing both the good things and the not-so-good things about drinking, how are you reacting to this topic?* Also try similar exploratory questions that will help you judge whether they are becoming defensive. Explore the answers using reflective listening and summarizing skills. You may want to illustrate, perhaps summarizing as follows:

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You could say something like:

You were saying that you were trying to decide whether to continue or cut down...
After this discussion, are you more clear about what you would like to do?

- Start by telling them that the next topic is "*Successful Changes*." Ask what that means to them.

- You could ask a group member for an example of a successful change.

  - Ask them to discuss the Stages of Change they cycled through.

  - Question the participant about their recollection of what helped and/or motivated him/her to change, using reflective listening skills.

- Make the discussion as concrete and simple as necessary to help participants understand the abstract concepts.

- Summarize by pointing out that they have the skills they need to make changes.

- The evidence exists in the form of previous successful changes.

1. Tell them that they may now be ready to consider implementing an action plan for changing their drinking. Examples would include:

"Even though you have begun to make changes in your drinking, there may be some other things you haven't thought about or some things you can do to maintain those changes. "

- Sometimes people will say – "I've already changed." You should reinforce that and ask what might happen if something gets in the way of those changes.

2. Give them the change plan worksheet. Allow time for completion, then ask the participants to share their plans. Be sure to reinforce at least one positive aspect of the plan, even if it is to say something like "I can tell you put a lot of thought into selecting a smaller problem that would be easy to handle. Now you will have a method for solving even bigger concerns if you choose to."

Remind them that this activity can be done whenever they need to develop a plan to make a change, no matter how big or small. This exercise is a life skill that can be applied outside the group experience.

IX. Importance, Confidence, and Desire to Change

"You are here because you are either thinking of making a change in your alcohol use or because someone else believes that you may need to change. Sometimes the change is to quit using alcohol but that may not be the focus for you."

"I'm going to pass out a paper with three scales for you to rate the importance of changing, your confidence in whether you can make changes, and how much you want to make a change in your alcohol use."

Distribute the Importance worksheet. Review the instructions on the sheet. After they have completed the sheet, review their responses. For each dimension (importance, confidence, desire), ask *"what makes your response a __, and not a 0? "* (assuming that their response wasn't a 0). This elicits a self-motivational statement that can be reflected or summarized.

Then ask**,** *"What might make you mark two higher on the scale?" (So* if the person has rated their importance 6, ask *"What might make you mark 8?').* This sensitizes you and the participants to events or concerns that can increase the participants' motivation to make a change.

For confidence, you could also ask, "*How can your family or friends help you increase your confidence (or desire) for making this change?"* Suggest that keeping these factors in mind while they implement their change plans can help to prevent setbacks.

For "desire," make sure to normalize feelings of dread if they are there. It is common for people to have negative feelings about making a change, even if they believe the change is important to make and they have strong confidence that they can achieve the intended change.

Remind them that making lasting changes often takes time and involves some setbacks. Take a few minutes to summarize your perceptions, and reflect on positive aspects that you have noticed (e.g., openness about vulnerable issues, determination to succeed, etc.). Ensure that the session ends on a positive note.

X. Ending the Session

Review follow-up expectations with the participant and remind them that they will be contacted at 3, 6, and 12 months for the web-based follow-up survey.

- End the session by stating that they are the best judges of what is right for them, and if they need to make a change.

- Give them a list of resources in your agency and area if they want to change and find they need more help.

- **Remind the participants that we will be contacting them for follow-up in the coming months**.

Stages of Change: Wheel Model

Stages of Change

Good things   **Not-So-Good things**

Change Plan Worksheet

The changes I want to make are:
The most important reasons why I want to make these changes are:
The steps I plan to take in changing are:
The ways other people can help me are:
I will know that my plan is working if:
Some things that could interfere with my plan are:

Importance, Confidence and Desire to Change

Most people are here because they are thinking about making a change, or because other people think they should make a change. Often, that change is to quit your use of alcohol altogether. However, that may not be the focus for you.

On the following 0 - 10 scale, please rate the importance <u>to you </u>of making a change in your drinking (or continuing to make a change that you've already begun). Please circle the number that most closely matches <u>the importance of this change to you</u>:

0   1   2   3   4   5   6   7   8   9   10

Not at all   *Most important*
Important   *thing in life*

Sometimes, even when goals or plans are important to us, we are still not sure if we can successfully achieve them. Please rate <u>your confidence </u>that you can successfully make (or maintain) the change in drinking you desire.

0   1   2   3   4   5   6   7   8   9   10

Not at all confident   *Completely confident*

Sometimes, even though we know a change is important and we are confident we can make it, we really aren't looking forward to making the change. Please circle the number that most closely matches <u>how much you want to make this change in your drinking</u>:

0   1   2   3   4   5   6   7   8   9   10

Dread making change   *Excited about the*
                                                               making the change

14

APPENDIX B:
POSTER PRESENTATIONS

Motivational Interventions to Reduce Alcohol Use in a Military Population

Kristine L. Rae Olmsted, MSPH[1]; Maj. Christine Hunter, PhD[2]; Janice M. Brown, PhD[1]*

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1. Background

In 1998, an estimated one in five military personnel were heavy alcohol users. In 2003, it was estimated that the Department of Defense (DoD) spends more than $600 million each year on health care costs related to alcohol abuse, and an additional $132 million to care for babies with fetal alcohol syndrome. Because alcohol dependence and problematic drinking can be expensive to treat and can result in serious health consequences including liver damage, impaired immune and endocrine system function, cardiomyopathies, polyneuropathies, psychosis, and can result in unintended consequences such as high-risk sex, occupational injury, drunk driving, domestic violence, and other negative social and/or health outcomes, the DoD would benefit from studies illustrating the performance of different alcohol interventions, as well as the cost-effectiveness of those interventions.

There is scant evidence regarding the effectiveness of specific alcohol use interventions in military populations, including motivational interviewing (MI). This study will empirically assess the effectiveness of two MI-based interventions compared with the Air Force's Substance Abuse Seminar (SAS). Findings from this study will provide information regarding potential interventions for use by the DoD as part of its alcohol abuse reduction initiative. Specifically, the data will help inform alcohol abuse prevention strategies targeted toward heavy-drinking personnel. Our findings will also have important implications for the DoD's efforts to develop comprehensive plans for treating alcohol abuse among military personnel. Finally, our results will help identify avenues for further research.
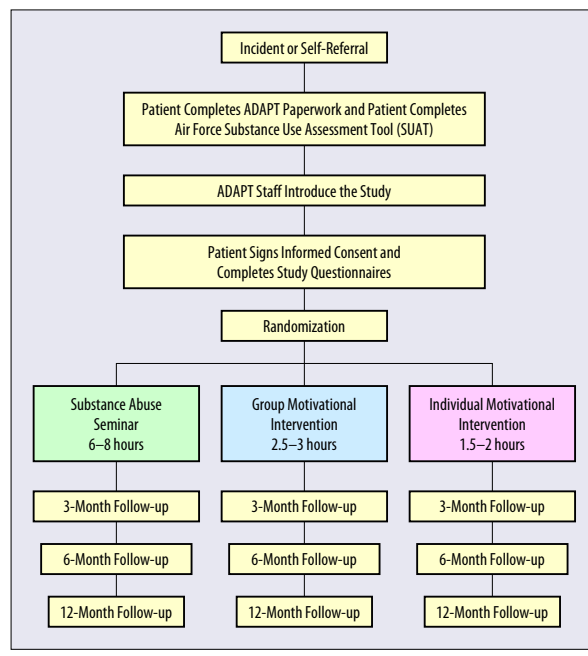
2. Objectives

The specific objectives for this study are to:

- **Objective 1:** *Evaluate the short- and long-term effectiveness of two motivational interventions with heavy-drinking military personnel.* We will test the effects of a motivational intervention delivered individually and in a group format to determine whether a group MI condition can produce outcomes similar to those demonstrated with individual MI.

- **Objective 2:** *Compare the group and individual motivational interventions with a SAS control group.* Results will provide information concerning the effectiveness of the current Air Force treatment and a comparison with two experimental conditions.

- **Objective 3:** *Test factors that may mediate or moderate responses to the MI interventions.* Motivational interventions are thought to be effective in reducing harmful drinking to the extent to which they trigger the change process (i.e., problem recognition, concern about drinking, and a desire to change drinking behavior). The assessment portion of the intervention will include measures of these factors to be tested as mediators and/or moderators of the intervention.

- **Objective 4:** *Assess the cost-effectiveness of the three interventions.* The cost-effectiveness analysis will provide an estimate of the additional cost, relative to the SAS, of achieving a given improvement in effectiveness using either of the MI interventions. The results from this analysis will allow decision makers to make fully informed treatment resource allocation decisions by weighing gains in effectiveness against any additional cost.

3. Study Design

The purpose of the study is to test the effectiveness of two brief intervention strategies for reducing heavy episodic drinking and negative consequences among military personnel. Individuals who are referred to a participating Air Force installation's ADAPT (Alcohol and Drug Abuse Prevention and Treatment program) for assessment (N=750) will be randomly assigned to one of three groups. Each treatment intervention will be conducted by a trained therapist.

- **IMI Condition:** Key elements of the IMI approach are (1) using an empathic therapist style, (2) helping participants perceive a discrepancy between their goals and their drinking, (3) eliciting self-motivational statements from participants, and (4) discussing alternatives for helping to change drinking behavior.

- **GMI Condition:** A group MI condition will be included to test whether MI delivered in a group setting is more effective than standard treatment (which also consists of a group intervention). While the elements of the GMI approach are the same as those for the IMI approach, individuals assigned to this condition will be seen in groups of six to eight. Each session will last approximately 3 hours.

- **Substance Abuse Seminar:** Individuals randomized to the SAS group will receive the education established by Air Force Instruction (AFI) 44-121, Section 3.14, which states: "All patients referred for substance abuse assessment who do not meet diagnostic criteria for alcohol abuse or alcohol dependence will be provided a minimum of 6 hours of awareness education. Substance abuse awareness education incorporates information on individual responsibility, Air Force standards, legal and administrative consequences of abuse, decision making, dynamics of substance abuse, biopsychosocial model of addictions, values clarification, impact of substance abuse on self and others, family dynamics, and goal setting."

Flowchart: Incident or Self-Referral → Patient Completes ADAPT Paperwork and Patient Completes Air Force Substance Use Assessment Tool (SUAT) → ADAPT Staff Introduce the Study → Patient Signs Informed Consent and Completes Study Questionnaires → Randomization → (Substance Abuse Seminar 6–8 hours / Group Motivational Intervention 2.5–3 hours / Individual Motivational Intervention 1.5–2 hours) → 3-Month Follow-up → 6-Month Follow-up → 12-Month Follow-up

4. Demographic Data

	Characteristic	Percent
Gender	Male	83.8
	Female	16.2
Marital Status	Married	25.0
	Single, Never Married	68.8
	Legally Separated	6.2
Family History of Alcohol Problems		12.2
Plans to Deploy in Next 3 Months		16.2
Education	GED or Did Not Graduate	6.3
	High School Diploma	87.5
	Associate's Degree	6.2

5. General Findings: Alcohol Use

	Characteristic	Percent
Drinks per Week	1 to 2	40.6
	3 to 4	25.0
	5 to 6	21.9
	7 or More	12.5
Heavy Days during Past 30 Days*	0	28.1
	1 to 2	56.3
	3 to 4	9.4
	5 or More	6.2
Number of Drinking Days during Past 30 Days	1 to 2	68.7
	3 to 4	18.7
	5 to 6	6.3
	7 or More	6.3
Mean Number of Drinks per Drinking Day	3 to 4	21.9
	5 to 6	25.0
	7 to 8	31.3
	9 to 10	9.3
	11 or More**	12.5
Number of Drinks on Heaviest Drinking Day	1 to 2	3.1
	3 to 4	25.0
	5 to 6	46.9
	7 to 10	9.4
	11 to 15	6.2
	16 to 20	9.4

* Five or more drinks per occasion for men; four or more drinks per occasion for women.

** Maximum of 22.

6. Alcohol Use During Referral Incident
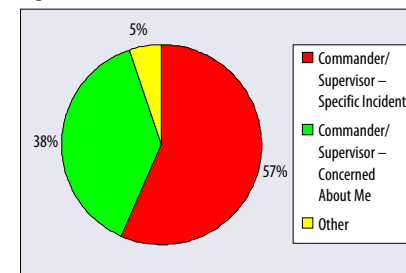
Figure 1. Reason for Referral

Pie chart: Commander/Supervisor – Specific Incident 57%; Commander/Supervisor – Concerned About Me 38%; Other 5%

Figure 2. Referral Incident Alcohol Quantity

Pie chart: 5 or Fewer Drinks 31%; 6 to 10 Drinks 38%; More than 10 Drinks 31%
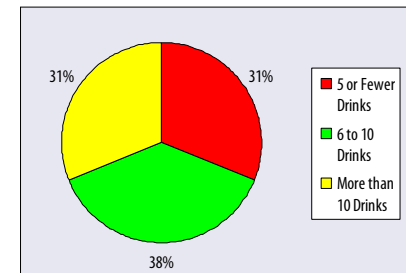
Figure 3. Referral Incident Location

Pie chart: On Base 60%; Off Base 40%
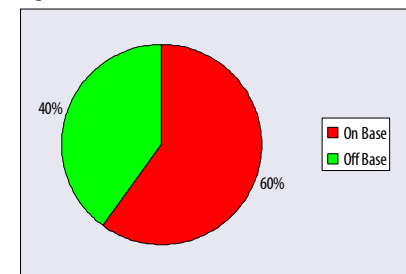
Figure 4. Referral Incident Specific Location

Pie chart: Club On Base 34%; Friend's Home 11%; Dorms 22%; At Work 22%; On Base–Other 11%
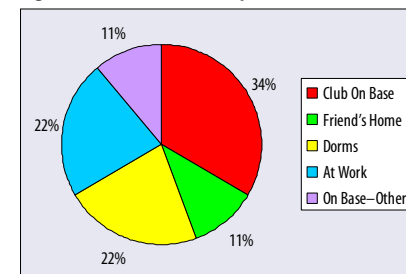
7. Alcohol Use: Culture and Productivity

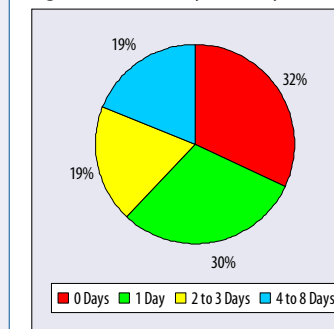| Alcohol Use Culture	% Agree or Strongly Agree
It's hard to fit in in my command if you don't drink	8.1
Drinking is part of being in my unit	16.2
Drinking is part of being in the Military	27.0
Drinking is just about the only recreation available at this installation	2.7
At parties/social functions, everyone is encouraged to drink	24.3
At parties/social functions, nonalcoholic beverages are not always available	35.1

Productivity Loss Items

How many days/times . . .

- Were you absent from work or regular duty?*
- Did you report late to or leave early from work or regular duty?*
- Were you late for work by 30 minutes or more?**
- Did you leave work early for a reason other than an errand or early holiday leave?**
- Were you hurt in an on-the-job accident?**
- Did you work below your normal level of performance?**
- Did you not come to work at all because of an illness/personal accident?**

* Past 30 days   ** Past 3 months

Figure 5. Productivity Loss (Days)

Pie chart: 0 Days 32%; 1 Day 30%; 2 to 3 Days 19%; 4 to 8 Days 19%

8. Tobacco Use

Figure 6. Cigarette Use

Pie chart: No 59%; Yes 41% (of which Less than 10 per day 47%; 10 to 20 per day 53%)

Figure 7. Smokeless Tobacco Use

Pie chart: No 76%; Yes 24%
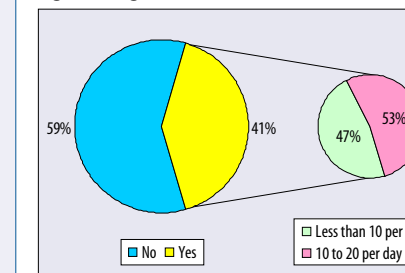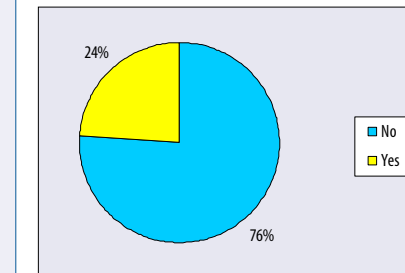
9. Moving Forward

For the current study, data will be collected through approximately Summer of 2008. Analyses will present, for the first time, comprehensive data about effective alcohol interventions in a military population. These data will be vital to understanding additional steps the Air Force might take in addressing issues of alcohol abuse, such as developing new treatment interventions, changing alcohol use policies and practices, instituting additional prevention approaches and programs, and incorporating recruit screening and selection methods.

In addition to providing outcome data for the current Air Force treatment approach, the research will yield comparison data for the cost and cost-effectiveness of alternative approaches. Results will provide key information that can improve the effectiveness of alcohol interventions to reduce alcohol use and its consequences in the Air Force, while directly supporting the efforts and strategic action plan of the Department of Defense (DoD) Alcohol and Tobacco Advisory Council (ATAC).

Group and Individual Motivational Interventions with Air Force Personnel

Janice M. Brown, PhD* and Kristine Rae Olmsted, MSPH • RTI International, Research Triangle Park, NC

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States and Local Communities in Prevention
Policies, San Diego, CA, January 27–30, 2008
RTI International is a trade name of Research Triangle Institute.

1. Introduction

Alcohol use continues to be a concern in military populations. Despite decreases in the prevalence of use of most legal and illegal drugs, consumption and abuse of alcohol remain at high levels. Approximately 70% of military personnel are current drinkers, and 20% of those are heavy episodic drinkers, defined as consuming five or more drinks on a single occasion at least once a week. Problem drinking is associated with a host of interpersonal, social, and health-related problems and can affect the military readiness of troops. Recently developed strategies to reduce heavy drinking involve the use of brief, motivational interventions that include a detailed assessment of alcohol use behavior.

In 1998, an estimated one in five military personnel were heavy alcohol users. In 2003, it was estimated that the Department of Defense (DoD) spends more than $600 million each year on health care costs related to alcohol abuse, and an additional $132 million to care for babies with fetal alcohol syndrome. Because alcohol dependence and problematic drinking can be expensive to treat and can result in serious health consequences including liver damage, impaired immune and endocrine system function, cardiomyopathies, polyneuropathies, psychosis, and can result in unintended consequences such as high-risk sex, occupational injury, drunk driving, domestic violence, and other negative social and/or health outcomes, the DoD would benefit from studies illustrating the performance of different alcohol interventions, as well as the cost-effectiveness of those interventions.

There is scant evidence regarding the effectiveness of specific alcohol use interventions in military populations, including motivational interviewing (MI). This study will empirically assess the effectiveness of two MI-based interventions compared with the Air Force's Substance Abuse Seminar (SAS). Findings from this study will provide information regarding potential interventions for use by the DoD as part of its alcohol abuse reduction initiative. Specifically, the data will help inform the use of alcohol abuse prevention strategies targeted toward heavy-drinking personnel. Our findings will also have important implications for the DoD's efforts to develop comprehensive plans for treating alcohol abuse among military personnel. Finally, our results will help identify avenues for further research.

2. Method

The purpose of the study is to test the effectiveness of two brief intervention strategies for reducing heavy episodic drinking and negative consequences among military personnel. Individuals who were referred to a participating Air Force installation's ADAPT (Alcohol and Drug Abuse Prevention and Treatment program) for assessment were randomly assigned to one of three intervention conditions.

- **Individual Motivational Interviewing (IMI) Condition:** Key elements of the IMI approach are (1) using an empathic therapist style, (2) helping participants perceive a discrepancy between their goals and their drinking, (3) eliciting self-motivational statements from participants, and (4) discussing alternatives for helping to change drinking behavior.

- **Group Motivational Interviewing (GMI) Condition:** A group MI condition has been included to test whether MI delivered in a group setting is more effective than standard treatment (which also consists of a group intervention). While the elements of the GMI approach are the same as those for the IMI approach, individuals assigned to this condition will be seen in groups of five to six. Each session will last approximately 2 hours.

- **Substance Abuse Seminar (SAS) Condition:** Individuals randomized to the SAS group will receive the education established by Air Force Instruction (AFI) 44-121, Section 3.14, which states: "All patients referred for substance abuse assessment who do not meet diagnostic criteria for alcohol abuse or alcohol dependence will be provided a minimum of 6 hours of awareness education. Substance abuse awareness education incorporates information on individual responsibility, Air Force standards, legal and administrative consequences of abuse, decision making, dynamics of substance abuse, biopsychosocial model of addictions, values clarification, impact of substance abuse on self and others, family dynamics, and goal setting."

3. Characteristics of the Sample

Table 1. Participant Characteristics

Characteristic	IMI	GMI	SAS	Total
Gender				
Male	78.8	95.0	81.0	83.8
Female	21.2	5.0	19.0	16.2
Marital Status				
Married*	36.4	40.0	19.1	32.5
Divorced	6.1	15.0	9.5	9.5
Single	48.5	45.0	66.7	52.7
Separated	9.1	0.0	4.8	5.4
Family history (alcohol)	46.2	35.7	46.7	43.6
Age (Mean)	27.3	7.5	25.5	26.3
Education				
GED or less	4.0	0.0	7.7	3.9
HS Diploma	88.0	76.9	92.3	86.3
Associate's Degree	4.0	15.4	0.0	5.9
Bachelor's Degree	4.0	7.7	0.0	3.9
Pay Grade				
E1–E3	48.0	30.8	60.0	47.2
E4–E7	48.0	61.5	40.0	49.1
O1–O3	4.0	7.7	0.0	3.8

*Includes 1 respondent living as married

Table 2. Alcohol Use Culture

	% Agree or Strongly Agree
It's hard to fit in if you don't drink	5.0
Drinking is part of being in my unit	7.1
Drinking is part of being in the Military	17.1
Drinking is the only recreation available	6.7
At social functions everyone is encouraged to drink	10.1
Non-alcoholic beverages are not always available	15.0

Figure 1. Referral Incident Specific Location On Base

Club On Base 12%, Friend's Home 16%, Dorms 36%, On Base—Other 24%, Car 12%
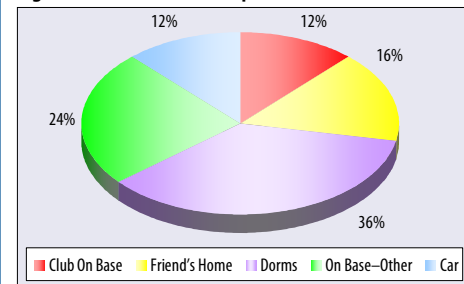
3. Results

Figure 2. Number of Drinking Days — Past Month

Baseline / Short-term follow-up
* Difference significant at .03
** Difference significant at .01
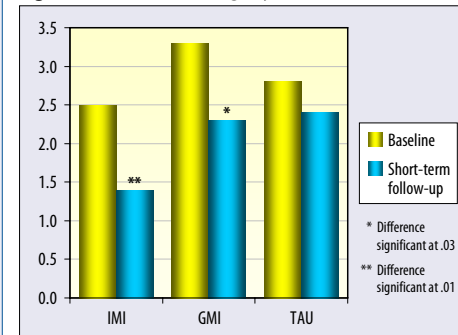
Figure 3. Average Number of Drinks — Past Month

Baseline / Short-term follow-up
* Difference significant at .03
** Difference significant at .01
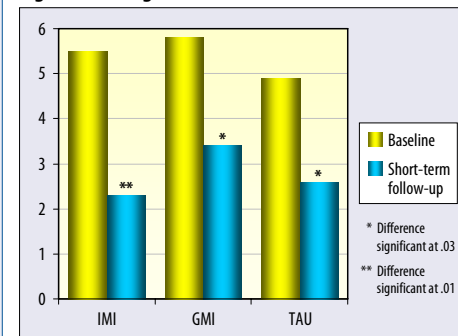
Figure 4. Largest Number of Drinks — Past Month

Baseline / Short-term follow-up
* Difference significant at .03
** Difference significant at .01
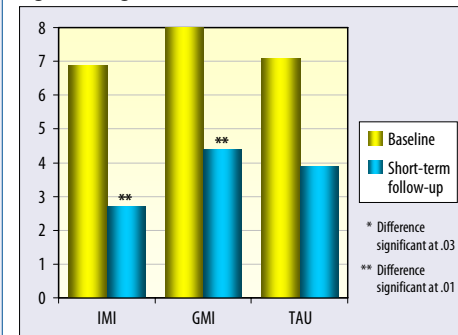
3. Results

Figure 5. Percent Heavy Drinking Days — Past Month

Baseline / Short-term follow-up
* Difference significant at .02
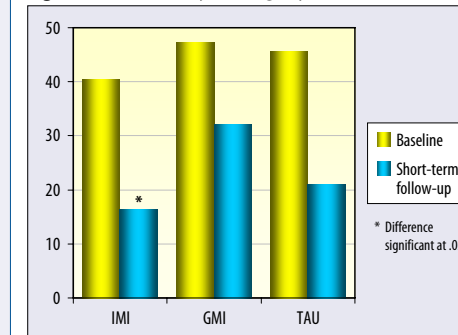
Table 3. Initial Models — Results

Measure	Estimate	DF	Significance Level
5+ drinks per drinking day			
Married/living as married*	-0.99	175	0.01
Any family history of alcohol problems*†	0.78	135	0.04
5+ drinking days in past month			
Married/living as married*‡	1.93	135	0.00
3+ binge days in past month			
Any family history of alcohol problems*‡	2.51	135	0.02

* Controlling for Gender
† Controlling for Marital Status
‡ Controlling for Family History of Alcohol Problems

- Both IMI and GMI resulted in significant decreases in the number of drinking days in the past month.

- Only the IMI condition produced a significant decrease in the percentage of binge drinking days.

- All three intervention conditions produced significant reductions in the average number of drinks per drinking occasion and in the total number of drinks during the heaviest drinking occasion.

- Those married/living as married were less likely than those never married to report heavy drinking.

- Those married or living as married more likely to report drinking on 5 or more days in past month

- Participants who reported having a blood relative with an alcohol problem more likely to report heavy drinking and binge drinking.

4. Conclusions

Current military alcohol abuse prevention programs aim to prevent the misuse of alcohol, eliminate the illegal use of alcohol by underage drinkers, provide counseling or rehabilitation to alcohol abusers, and provide education to various target audiences about the risks associated with alcohol use. Although these efforts have been ongoing and a number of studies have reported on the consequences of alcohol use in the military no published studies were found that examined the effectiveness of alcohol misuse prevention and treatment programs in the military.

Results of this research indicated that all three interventions resulted in decreased alcohol use. The two MI conditions produced more positive outcomes than treatment as usual with respect to the number of drinking days and the percentage of heavy, or binge drinking days. Significant decreases were found across all conditions for the average number of drinks consumed per drinking occasion and while not statistically significant, for the number of drinks consumed during the heaviest drinking occasion. The results are particularly exciting as this is one of the first true tests of a group motivational intervention and we were able to demonstrate that it is possible not only to do MI in a group format, but to produce results similar to those found with individual MI.

We also examined risk and protective factors for alcohol use and were able to determine that being married is protective against binge drinking and that individuals with a family history of alcohol problems are at the highest risk for binge drinking.

Alcohol use is problematic among young adults. Military personnel are at particular risk as they transition from the parental environment to one in which they must begin to assume responsibility for their own choices and behavior, and one that normalizes alcohol use. Reducing the prevalence and frequency of heavy drinking among military personnel would result in considerable harm reduction, increased capacity for rapid mobilization, and safer military communities. As shown in our preliminary results, the MI interventions tested in the present study resulted in significant decreases in heavy alcohol use.

In moving forward, these brief MI interventions could be more widely applied in social marketing techniques to the broader military population. Clearly, the development of effective primary and secondary prevention strategies should be based on methodologies that have a firm foundation in theory and preliminary research support. The present study encompasses an innovative, theoretical approach to providing an intervention for use with problem drinkers.

Group and Individual Motivational Interventions with Air Force Personnel

Janice M. Brown, PhD, and Randall H. Bender, PhD • RTI International, Research Triangle Park, NC

1. Introduction

Alcohol use continues to be a concern in military populations. Despite decreases in the prevalence of use of most legal and illegal drugs, consumption and abuse of alcohol remain at high levels. Approximately 70% of military personnel are current drinkers, and 20% of those are heavy episodic drinkers, defined as consuming five or more drinks on a single occasion at least once a week. Problem drinking is associated with a host of interpersonal, social, and health-related problems and can affect the military readiness of troops. Recently developed strategies to reduce heavy drinking involve the use of brief, motivational interventions that include a detailed assessment of alcohol use behavior.

Alcohol use is problematic among young adults in general. Military personnel are at particular risk as they transition from the parental environment to one in which they must begin to assume responsibility for their own choices and behavior and one that normalizes alcohol use. Reducing the prevalence and frequency of heavy drinking among military personnel would result in considerable harm reduction, increased capacity for rapid mobilization, and safer military communities. As shown in our results, the motivational interventions (MIs) tested in the present study resulted in decreased alcohol use at 3-month follow-up.

This study assessed the effectiveness of two MI-based interventions compared with the Air Force's Substance Abuse Seminar (SAS). Findings from this study provide information regarding potential interventions for use by the DoD and the Air Force as part of its alcohol abuse reduction initiative. Specifically, the data will help inform alcohol abuse prevention strategies targeted toward heavy-drinking personnel. Our findings have had important implications for Air Force efforts to develop comprehensive plans for treating alcohol abuse among military personnel.

2. Method

The purpose of the study was to test the effectiveness of two brief intervention strategies for reducing heavy episodic drinking and negative consequences among military personnel. Individuals who were referred to a participating Air Force installation's ADAPT (Alcohol and Drug Abuse Prevention and Treatment) program for assessment were consented and randomly assigned to one of three intervention conditions:

- Individual Motivational Interviewing (IMI) Condition
- Group Motivational Interviewing (GMI) Condition
- Substance Abuse Seminar (SAS) Condition.

3. Analyses

- Small sample sizes, skewed distributions, and numerous statistical outliers required methods that could stand up to these data.
- Multiple group and pairwise comparisons were conducted using the Mann-Whitney-Wilcoxon test and Kruskal-Wallis test. These are tests using simple linear rank statistics. P-values were obtained using exact methods. Analysis was done using the SAS implementation in Proc NPAR1WAY.
- Regressions were done using Huber M estimation (Huber, 1973), a regression methodology that reduces the impact of outliers on regression estimation. Analysis was done using the SAS implementation in Proc RobustReg.

4. Results

- Three outcome variables were examined: binge drinking days, average drinks per drinking episode, and maximum drinks in a drinking day.
- All three intervention conditions produced significant reductions in the average number of drinks per drinking occasion and in the total number of drinks during the heaviest drinking occasion (see Figure 1).
- Only the IMI condition produced a significant decrease in the percentage of binge drinking days (see Figure 2).
- Only the IMI condition produced a significant decrease in the maximum number of drinks on a heavy drinking day (see Figure 3).
- Tests for treatment effects on baseline and 3-month follow-up drinking behavior and changes in drinking behavior between baseline and follow-up data collection revealed the following:
  - There were no differences among the three groups at baseline on drinking measures.
  - At 3-month follow-up, binge drinking in the IMI group was lower than in both the GMI (p=.014) and TAU (p=.024) groups.
  - Consistent with this, the drop in binge drinking between baseline and follow-up was greater in IMI than in TAU (p=.044) (see Figure 4).
  - We also found the drop in maximum drinks between baseline and follow-up was greater in IMI than in TAU (p=.037) (see Figure 5).
- Further analyses examining the effect of moderators, tested interaction effects between the treatment group variable and SOCRATES scores for Taking Steps, Problem Recognition, and Ambivalence, with the following significant result:
  - Problem Recognition was a significant moderator of the treatment effect (GMI versus TAU, p=.047) on the change in binge drinking between baseline and follow-up. Figure 6 presents the model predicted regression lines for GMI and TAU displaying the moderating effect of Problem Recognition (RESUM) on the treatment effect.
- Analyses investigating whether change in Desire, Confidence, or Importance post-intervention was associated with the change in drinking behavior between baseline and follow-up found *no significant associations*.

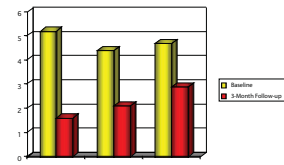**Figure 1. Average Drinks Per Week**
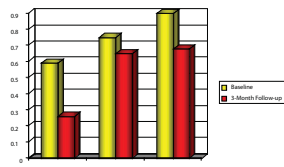
Figure 2. Number of Binge Drinking Days

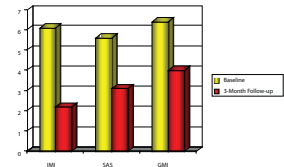**Figure 3. Maximum Drinks On Drinking Day**

Figure 4. Decrease in binge drinking from baseline to 3-month follow-up is greater for IMI group than TAU group.
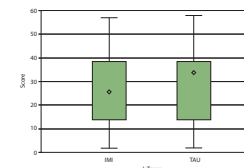
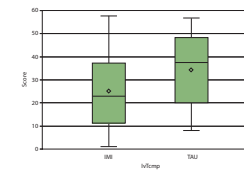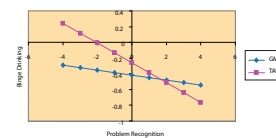**Figure 5. Decrease in maximum drinks from baseline to 3-month follow-up is greater for IMI group than TAU group.**

Figure 6. Problem recognition moderates the GMI treatment effect on change in binge drinking in comparison with TAU.

5. Discussion

Current military alcohol abuse prevention programs aim to prevent the misuse of alcohol, eliminate the illegal use of alcohol by underage drinkers, provide counseling or rehabilitation to alcohol abusers, and provide education to various target audiences about the risks associated with alcohol use. Although these efforts have been ongoing and a number of studies have reported on the consequences of alcohol use in the military, no published studies were found that examined the effectiveness of these alcohol misuse prevention and treatment programs in the military.

Results of this research indicate that all three interventions resulted in decreased alcohol use. The individual MI (IMI) condition produced larger drops in negative drinking behavior measures than GMI or the SAS program, namely the number of binge drinking days and the largest number of drinks on heavy drinking days.

One moderator of the treatments was found. When problem recognition coming into treatment is low, GMI has a larger effect on dropping binge drinking than TAU. When problem recognition is high, the GMI treatment does not have distinguishable effects from TAU on binge drinking. This suggests that GMI may have its greater efficacy in reducing binge drinking through raising the level of problem recognition. Unfortunately, we did not have a post-intervention measure of problem recognition to confirm this.

In moving forward, a brief MI intervention could be more widely applied in social marketing techniques to the broader military population. Clearly, the development of effective primary and secondary prevention strategies should be based on methodologies that have a firm foundation in theory and preliminary research support. The present study encompasses an innovative, theoretical approach to providing an intervention for use with problem drinkers.

Contact Information

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RTI International is a trade name of Research Triangle Institute.

APPENDIX C:
BRIEFINGS AND SYMPOSIA

Motivational Interventions to Reduce Alcohol Use in a Military Population

Presented at

Presented by
Major Christine Hunter. Ph.D.
Janice M. Brown Ph.D.

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Rationale

- Alcohol misuse continues to be a major problem (estimated costs to DoD of over $2.2 billion annually)

- Rates of heavy drinking in the Air Force are the same today as they were twenty years ago

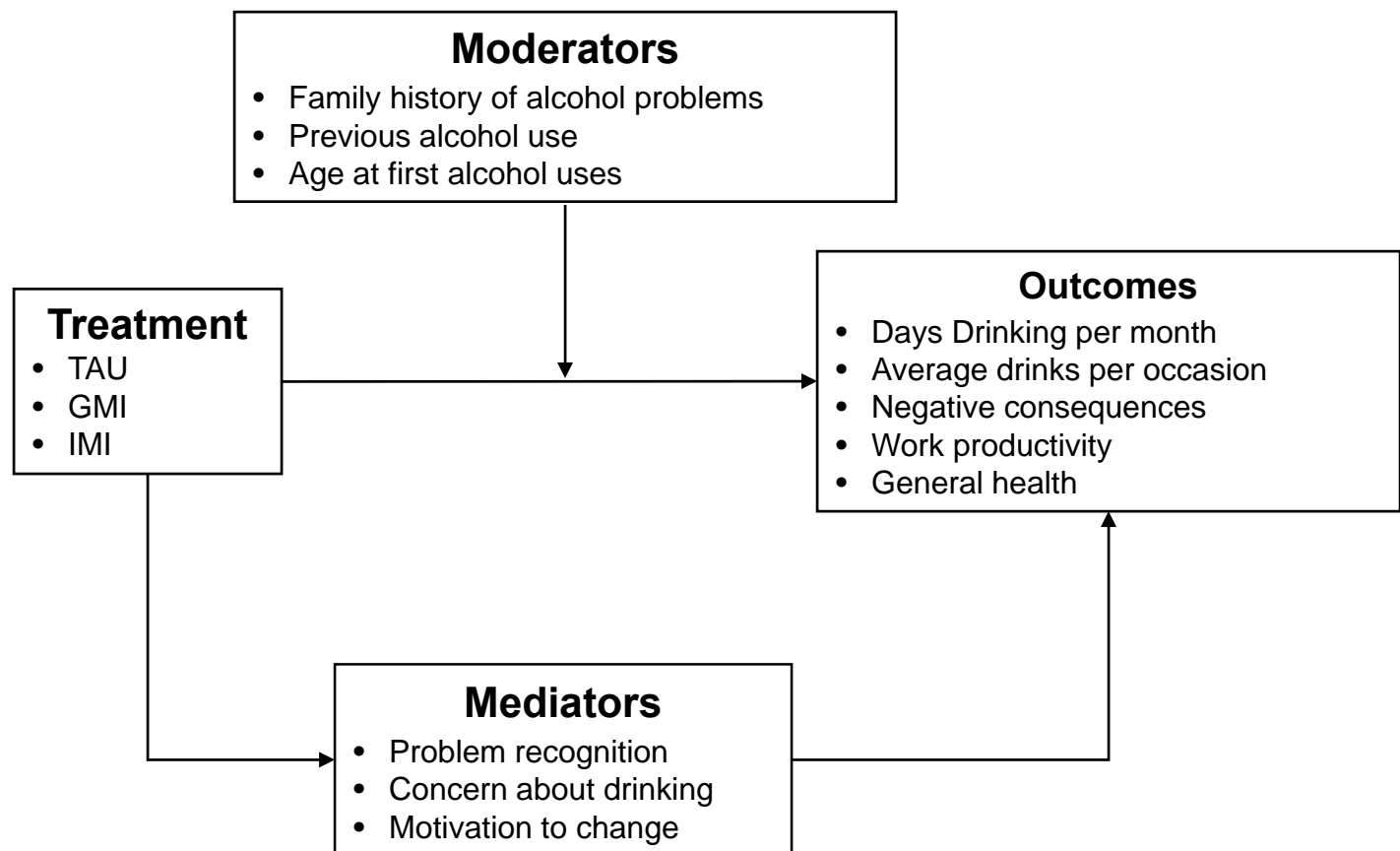- Current ADAPT Program effectiveness is not known

Hypotheses

- *Hypothesis 1:* The motivational intervention conditions (IMI and GMI) will result in greater decreases in heavy drinking, alcohol-related consequences, peak eBAC, and average number of drinks.

- *Hypothesis 2:* The IMI condition will result in greater decreases in alcohol use variables relative to the GMI condition.

- *Hypothesis 3:* The motivational interventions will result in greater increases in change variables compared to the TAU condition.

- *Hypothesis 4:* Previous heavy drinking, family history, and a younger age of initiation will be associated with a more negative outcome.
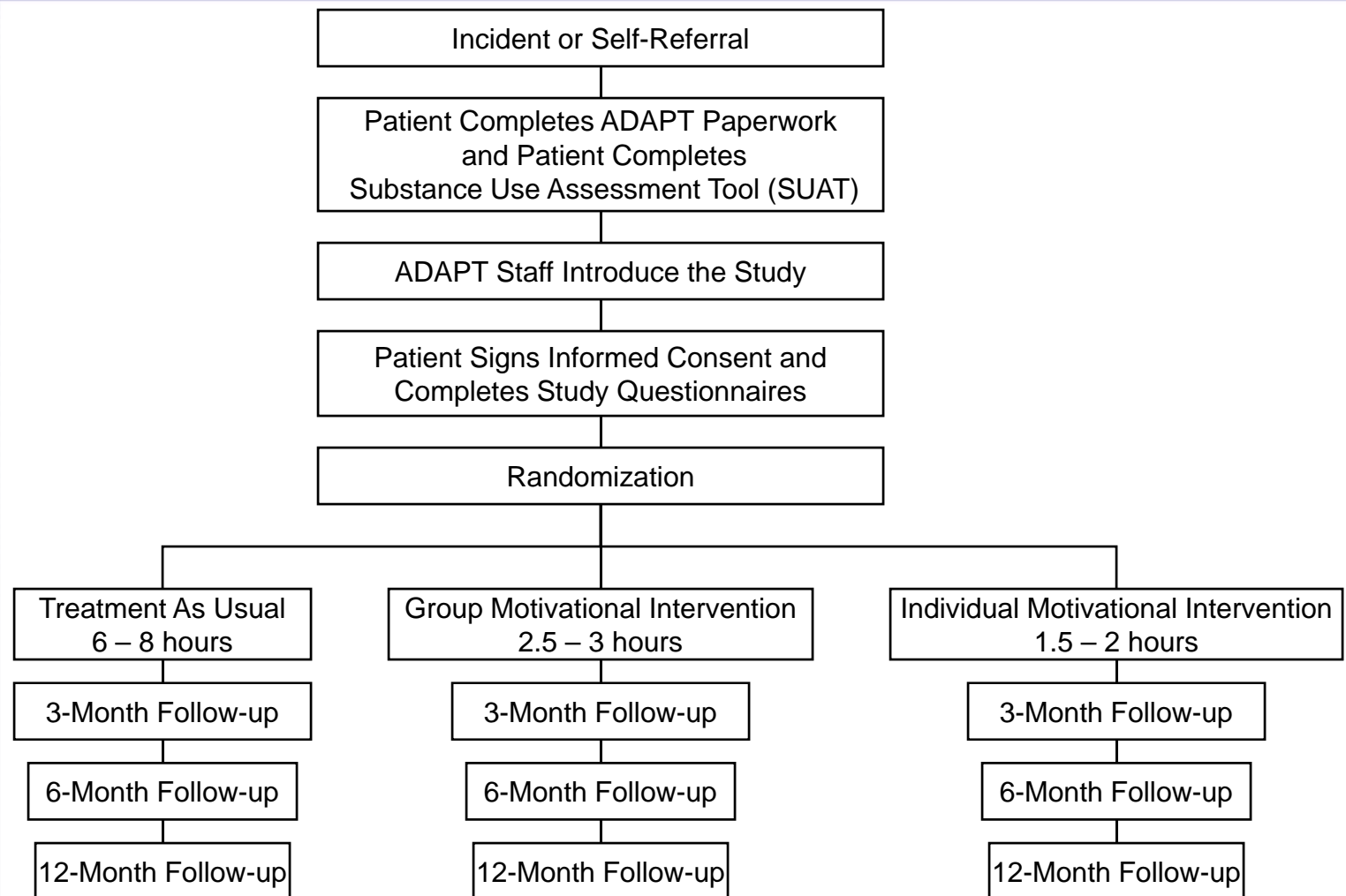
Technical Objectives

- To evaluate the short-and long-term effectiveness of two motivational interventions with heavy-drinking Air Force trainees.

- To compare group and individual motivational interventions with each other and with treatment as usual.

- To test mediators and moderators of the interventions' effects.

- To assess the cost-effectiveness of the three interventions.

Model of Intervention Effects

Moderators
- Family history of alcohol problems
- Previous alcohol use
- Age at first alcohol uses

Treatment
- TAU
- GMI
- IMI

Outcomes
- Days Drinking per month
- Average drinks per occasion
- Negative consequences
- Work productivity
- General health

Mediators
- Problem recognition
- Concern about drinking
- Motivation to change

Study Design

Interventions

- Group Motivational Intervention (GMI)
  - Group format
  - Group dynamics
    - Group polarization
    - Production blocking

  - Alcohol use, problems, solutions
  - 3-hour session

Interventions

- Individual Motivational Intervention (IMI)
  - Individual format
  - Alcohol use, problems, solutions
  - 1.5- to 2-hour session

Interventions

- Treatment As Usual (TAU)
  - Group format
  - Education and information
  - 6- to 8-hour session

Ensuring Integrity of Interventions

- Training and supervision
  - Experienced staff
  - Manualized treatment
  - Training sessions/booster training sessions

- Tape coding (for IMI and GMI only)
  - Supervision
  - Three-pass coding
  - Double coding 10%

Assessment Instruments

- Substance Use Assessment Tool (SUAT)

- Baseline supplemental web survey

- Follow-up web surveys

Follow-up Assessment

- Short-term outcomes
  - 3-month assessment

- Intermediate outcomes
  - 6-month assessment

- Longer-term outcomes
  - 12-month assessment

Cost-Effectiveness

- Total cost of each intervention (cost per hour)

- Assessment administered on-site

- Includes salaries, supplies, facilities, equipment, and total time to deliver interventions

- Combined with effectiveness data

- Includes productivity and health care costs of participants

Military Relevance

- Supports ADAPT objectives
  - Promote readiness, health, and wellness
  - Minimize negative consequences
  - Return individuals to service

- Provides understanding of effective approaches

- Provides cost-effectiveness information

- Longitudinal design may identify key events or conditions to target for change

Base ADAPT Program Costs

- Direct costs to base: None

- Indirect costs to base:
  - 15 minutes per participant for study documents (including informed consent and extra questionnaires)
  - Two days away from normal duty to attend initial training
  - One day away from normal duty every six months to attend booster training

Materials Provided by RTI

- Each Base will receive:
  - Computer equipment (1 desktop setup)
  - A set of 7 professional training videotapes on Motivational Interviewing
  - Questionnaires in addition to the SUAT
  - Any additional materials necessary to implement the project (including tape recorders, audio tapes, and books)

Study Summary

- Evaluates current intervention approaches

- Provides an alternative to current ADAPT Program interventions

- Provides the Air Force with cost-effectiveness information on treatment approaches

- No direst costs associated with participation

- Supplies the ADAPT programs with materials they may continue to utilize long after the study is completed

Motivational Interventions to Reduce Alcohol Use in a Military Population: Cost and Effectiveness

Alexander J. Cowbell, Ph.D.

October 16, 2007

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- P.I.'s are Maj. Nicole Frazer and Dr. Janice Brown

- Many colleagues at RTI and US Air Force
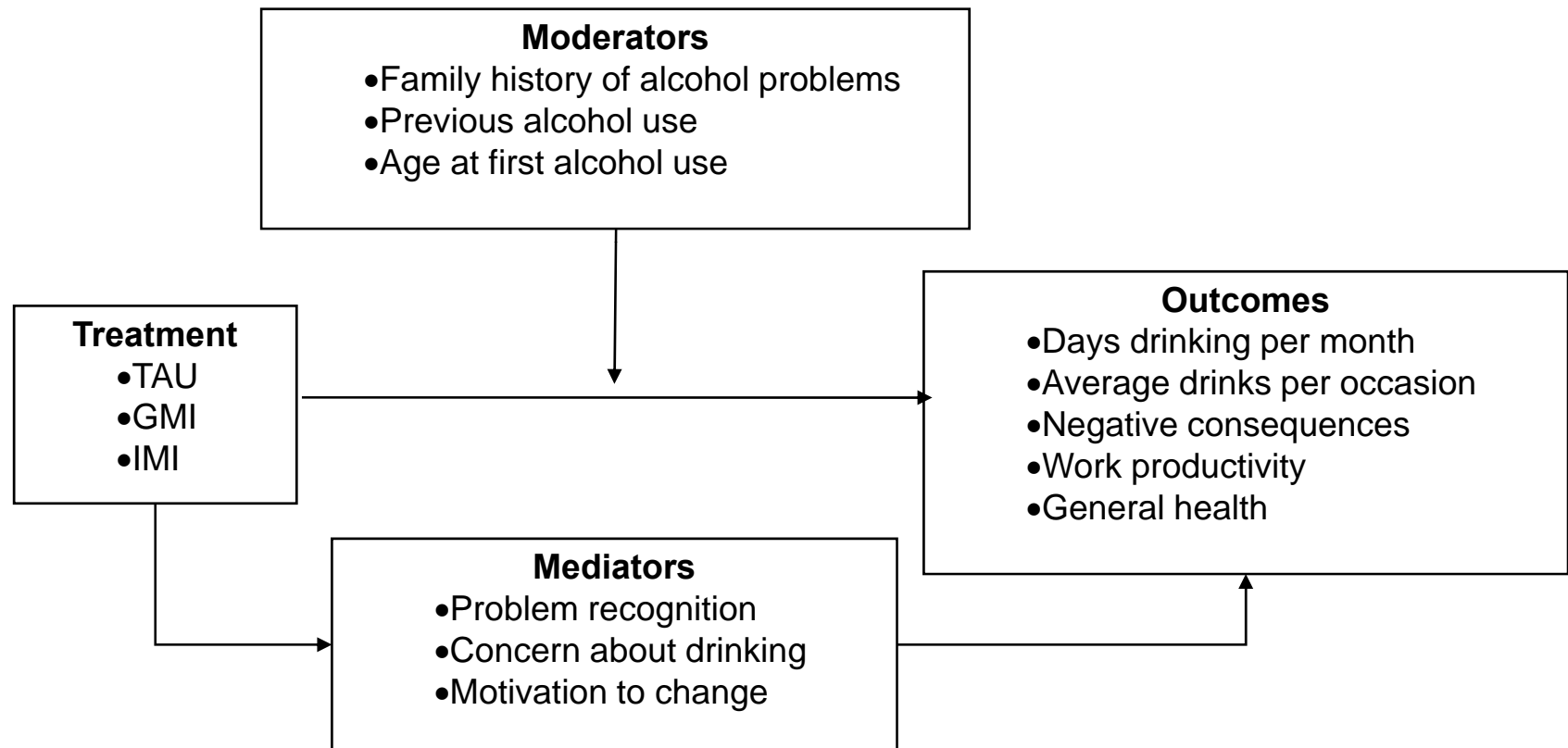
- Yutan Masuda

- Funding from DOD # W81XWH-04-1-0072

Structure of Presentation

- Background
  - Cost Study Objectives
  - Approach
- Preliminary Results
- Conclusions

Introduction

Model of Intervention Effects

Interventions

- **Treatment as Usual (TAU)**
  - Standard treatment for Air Force personnel involving a full day of alcohol education and information sessions
  - 6-10 hour session

- **Group Motivational Interview (GMI)**
  - Participants receive a brief motivational interview session in a group setting
  - 2-2.5 hour session

- **Individual Motivational Interview (IMI)**
  - Participants receive a one-on-one brief motivational interview session
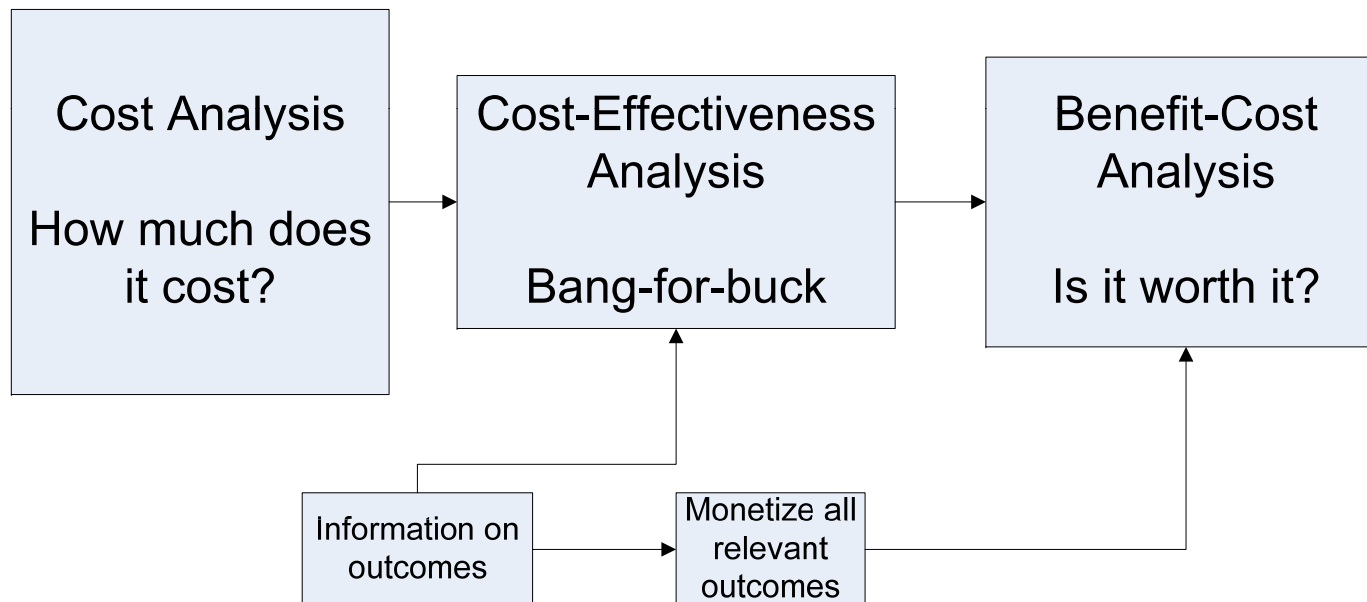 - .5-1 hour session

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Technical Objectives

- To examine the costs for three variants motivational interviewing (MI): Treatment As Usual (TAU), Group MI (GMI), and Individual MI (IMI)

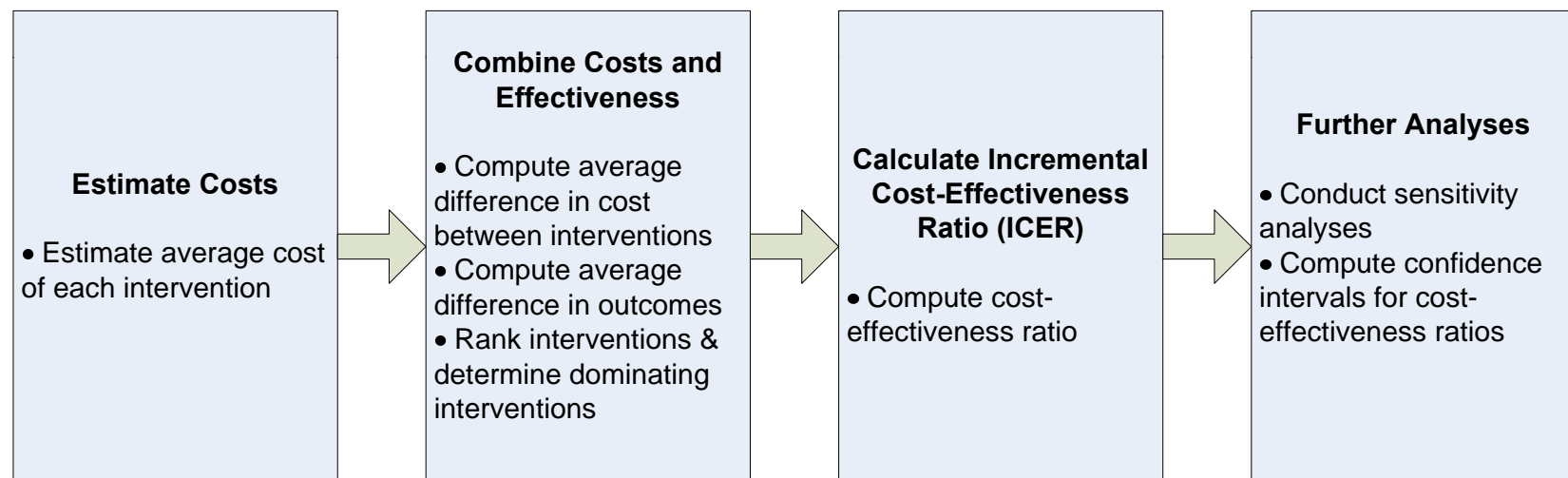- To examine the cost-effectiveness of TAU, GMI, and IMI

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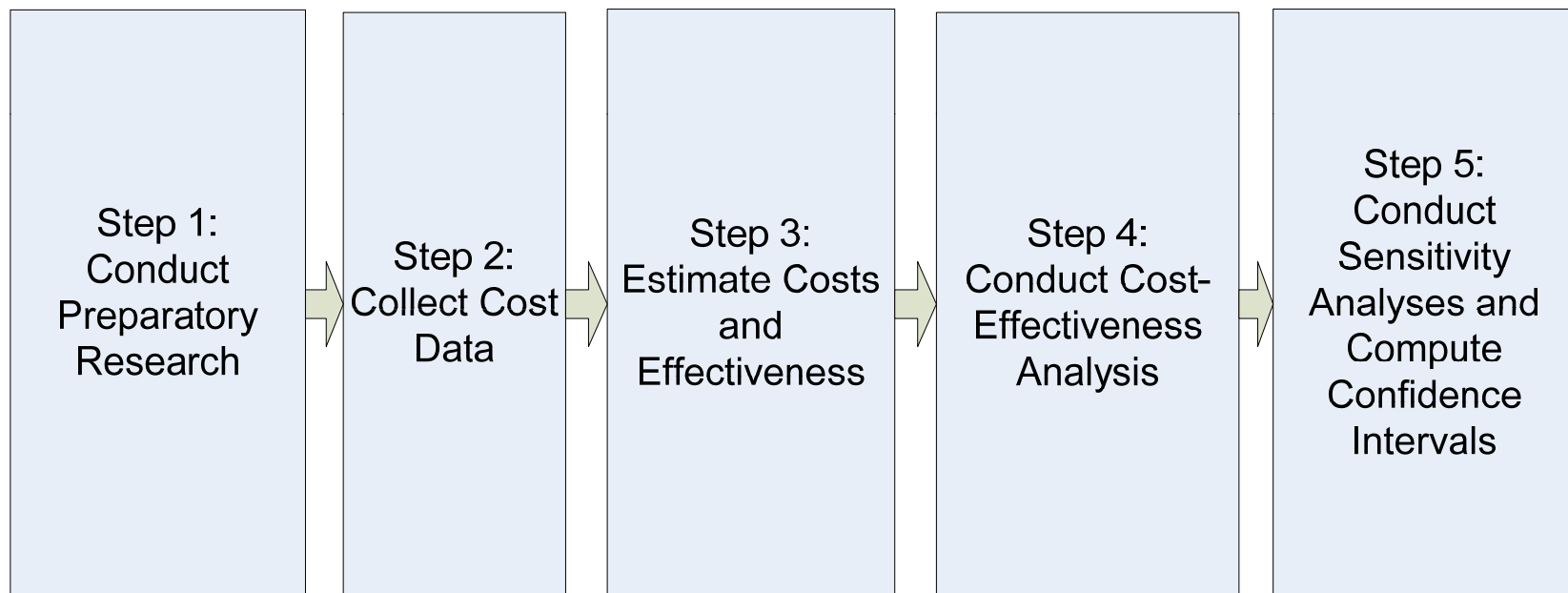INTERNATIONAL

Methods

Methods: Types of Cost Analyses

Estimate Costs

• Estimate average cost of each intervention

Combine Costs and Effectiveness

• Compute average difference in cost between interventions
• Compute average difference in outcomes
• Rank interventions & determine dominating interventions

Calculate Incremental Cost-Effectiveness Ratio (ICER)

• Compute cost-effectiveness ratio

Further Analyses

• Conduct sensitivity analyses
• Compute confidence intervals for cost-effectiveness ratios

10

Methods: The Five Steps of Cost-Effectiveness Analysis

| Step 1: Conduct Preparatory Research | Step 2: Collect Cost Data | Step 3: Estimate Costs and Effectiveness | Step 4: Conduct Cost-Effectiveness Analysis | Step 5: Conduct Sensitivity Analyses and Compute Confidence Intervals |

Methods: Sample

- Setting: 4 Air Force Bases (3 currently active)

- Target Population: heavy drinkers among military personnel

- Target n = 675

  - 225 for each intervention arm

- Data collection started in 01/2006 and is ongoing

Methods: Enrollment

- Eglin AFB = 77
  - TAU = 34
  - GMI = 19
  - IMI = 24

- Offutt AFB = 74
  - TAU = 26
  - GMI = 24
  - IMI = 24

- Lake health AFB = 20
  - TAU = 8
  - GMI = 5
  - IMI = 7

- Sheppard AFB = 24
  - TAU = 9
  - GMI = 5
  - IMI = 10

*As of October 2, 2007
*Includes those who are now inactive

Methods: Enrollment cont.

Intervention Arm	Enrolled N (used here)	**FU-rate
TAU	53	14/41 (34%)
GMI	39	15/32 (47%)
IMI	46	18/40 (45%)
Total	138	47/113 (42%)

*As of October 2, 2007

**As of May 1, 2007

Methods: Data Collection

- Cost Data
  - Specifically designed quarterly instrument
    - Training hours
    - Time spent on each intervention
    - Space (in square feet) of intervention room

- Outcome data
  - Self administered web surveys
  - Baseline, 3, 6, and 12 months

Methods: Cost Effectiveness

- What is Cost-effectiveness?

  - Results describe trade-off between an improvement in the outcome and the cost required to achieve it, or

  - How much does it cost to achieve a 1 unit improvement in the outcome, or

  - "bang for buck" (really "buck per bang")

Methods: Incremental Cost-Effectiveness Ratio (ICER)

- Rank order interventions from lowest to highest cost per intervention

- Eliminate dominated interventions from further consideration

- Compute incremental cost-effectiveness ratios (ICERs)

$$ICER = \frac{\Delta C}{\Delta E} = \frac{(Average\,Cost_j - Average\,Cost_k)}{(Average\,Outcome_j - Average\,Outcome_k)}$$

Methods: Estimating Cost

$$Cost\ per\ Intervention = \sum_{j=1} \overset{\wedge}{Cost\ per\ Unit_j} \times Number\ of\ Units_j = \sum_{j=1} \overset{\wedge}{p_j q_j}$$

- For each session
    - Labor - time staff spent conducting session
    - Space - cost of space used during session

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Preliminary Results

- 4 Quarters of Data

- Assumptions

  - Wages are not fully loaded

  - For space cost used Offutt AFB's space costs for all bases

  - Imputed time for training costs for missing data

Preliminary Results

Training Times

Base	Mean Training Time (in hours)	Mean Cost by Trainee Salary	Mean Total Cost
Eglin	46.4	$1,102.60	$1,336.68
**Sheppard	27.9	**$657.44	**$710.50
**Offutt	**31.6	**$738.06	**$750.06
Lake heath	26.5	$704.88	1,000.91
Total Per Trainee	33.1	$817.50	$980.92

*In 2007 dollars

**Imputed data

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Average Cost Per Session

- Including salary and space cost

- Per session across all three bases

Intervention	Cost
TAU	$213.30
GMI	$70.34
IMI	$46.19

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Average Intervention Cost Per Participant By Base

- Including salary and space cost

- Per participant by base

Intervention	Eglin	L' heath	Offutt
TAU	$13.91	$21.69	$27.54
GMI	$25.89	$6.03	$16.44
IMI	$37.96	$47.71	$47.92

ICER

Treatment Arm	Mean Cost ($)	Number of Heavy Drinking Days		Total Drinking Days		Maximum Number of Drinks	
		Mean Effectiveness	ICER (ΔC/ΔE, $)	Mean Effectiveness	ICER (ΔC/ΔE, $)	Mean Effectiveness	ICER (ΔC/ΔE, $)
GMI	19.78	1.31	-	2.31	-	6.37	-
TAU	29.91	1.55	Dominated (strict)	3.27	Dominated (strict)	5.55	Dominated (extended)
IMI	43.58	0.86	-52.88	2.14	-139.98	3	-7.06

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ICER cont.

Treatment Arm	Mean Cost ($)	Number of drinks per week		Mean drinks on a drinking day		Percentage of days of heavy drinking	
		Mean Effectiveness	ICER (ΔC/ΔE, $)	Mean Effectiveness	ICER (ΔC/ΔE, $)	Mean Effectiveness	ICER (ΔC/ΔE, $)
GMI	19.78	3.84	-	4.77	-	39.62	-
TAU	29.91	3.95	Dominated (strict)	3.7	Dominated (extended)	32.11	Dominated (extended)
IMI	43.58	2.55	-18.44	2.25	-9.44	19.12	-1.16

ICER cont.

Treatment Arm	Mean Cost ($)	Total number of drinks per month	
		Mean Effectiveness	ICER ($\Delta C/\Delta E$, $)
GMI	19.78	15.37	-
TAU	29.91	15.82	Dominated (strict)
IMI	43.58	10.21	-4.61

Next Steps

- **Loading salary costs**
  - In Air Force, benefits include
    - Food
    - Housing
    - Cost of living allowances (COLAs) if overseas

- **Include uncertainty**

- **Move to a cost-benefit analysis**
  - Have value of participant time
    - Full cost of participating in intervention
    - Value of any reduced absenteeism
  - Value or cost of health care

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Discussion and Conclusion

- Preliminary results suggest that TAU is dominated, regardless of the drinking outcome

- Using individual rather than group MI intervention,

  - a 1 percent reduction in days of heavy drinking →$1 per participant

- Complete data collection and cost-benefit yet to come

Motivational Interventions to Reduce Alcohol Use in a Military Population

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Technical Objectives

➢ To evaluate the effectiveness of two motivational interventions with Air Force personnel referred to Alcohol and Drug Abuse Prevention and Treatment (ADAPT) program for screening.

➢ To compare Group and Individual Motivational Interventions (GMI and IMI) with each other and with the Substance Abuse Seminar (SAS) currently offered.

➢ To test mediators and moderators of the interventions' effects.

Individual Motivational Intervention (IMI)

➢ Individual format
➢ Based on Miller & Rollnick principles
➢ Manualized intervention
➢ Tape recorded session
➢ Alcohol use, problems, solutions
➢ No feedback provided
➢ .75 to 1-hour session

Group Motivational Intervention (GMI)

- ➢ Group format
- ➢ Group dynamics
  - Group polarization
  - Production blocking
  - Social Loafing
- ➢ Manualized intervention
- ➢ Tape recorded session
- ➢ Alcohol use, problems, solutions
- ➢ No feedback provided
- ➢ 2 to 2.5-hour session

Group Dynamics

➢ **Group polarization**

- Actively seek alternative viewpoints
- Allow for different goals
- Reframe

➢ **Production blocking**

- Generate multiple ideas
- Allow each member to start a discussion
- Decrease waiting period

➢ **Social Loafing**

- Increase the identifiability of contributions
- Enhance cohesiveness
- Personal involvement

Substance Abuse Seminar (SAS)

- ➢ Group format
- ➢ Air Force standard
- ➢ Education and information
- ➢ Multiple speakers
- ➢ No feedback provided
- ➢ 6- to 8-hour session

Demographic Data

Gender

	Male	81.3%
	Female	18.7%

Marital Status

	Married	27.1%
	Single	61.7%
	Sep/Div	11.2%

Family History (Alcohol)   44.6%

Age   26.7 (19-43)

Demographic Data (cont.)

Education

GED or less	2.9%
H.S. Graduate	85.4%
Associate Degree	8.8%
Bachelor's Degree	2.9%

Paygrade

E1 – E3	48.6%
E-4 – E7	47.3%
O1 – O3	4.1%

Baseline Alcohol Use – Past 30 Days

Number of Drinks per Drinking Day

1 to 2	11.5%
3 to 4	42.7%
5 to 6	25.0%
7 to 8	7.3%
9 to 10	5.2%
11 or More	8.3%

Number of Drinks on Heaviest Drinking Day

1 to 2	8.3%
3 to 4	26.0%
5 to 6	29.2%
7 to 10	20.8%
11 to 15	9.4%
16 to 22	6.3%

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Baseline Alcohol Use – Past 30 Days

Drinks per Week

1 to 4	76.0%
5 to 7	16.7%
8 or More	7.3%

Heavy Days during Past 30 Days*

0	35.0%
1 to 2	53.0%
3 to 4	11.0%
5 or More	1.0%

Number of Drinking Days during Past 30 Days

1 to 2	58.3%
3 to 4	29.2%
5 to 6	10.4%
7 or More	2.1%

Alcohol Use Disorders Identification Test (AUDIT)

➤ Non-Problem Drinking   80.3%

  • AUDIT score <8

➤ Hazardous Drinking   16.9%

  • AUDIT score 8-15

➤ Harmful Drinking   2.8%

  • AUDIT score 16-19

➤ Possible Dependence   0.0%

  • AUDIT Score $\geq$20

Reason for Referral

6%

13%

3%

78%

Legend:
- Commander–Specific Incident
- Commander - Concerned About Me
- Medical Provider
- Self-Referral

Referral Incident:
Alcohol Quantity

28%

43%

29%

- 4 or fewer drinks
- 5 to 9 drinks
- 10 or more drinks

Referral Incident:
Specific On-Base Location

Legend:
- Dorms
- My Home
- In a Car
- Club
- Other

Pie chart values: 60%, 13%, 9%, 9%, 9%

Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES)

Readiness to Change Questionnaire (RTCQ)
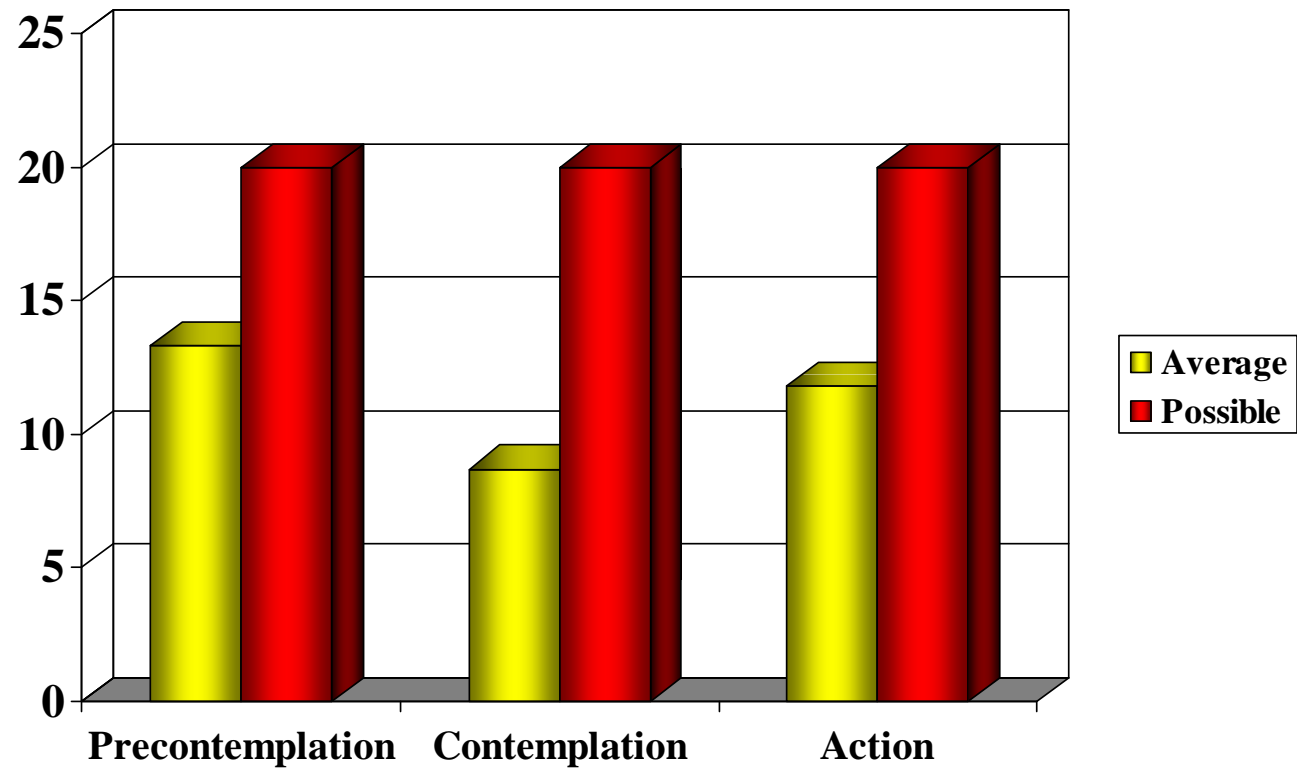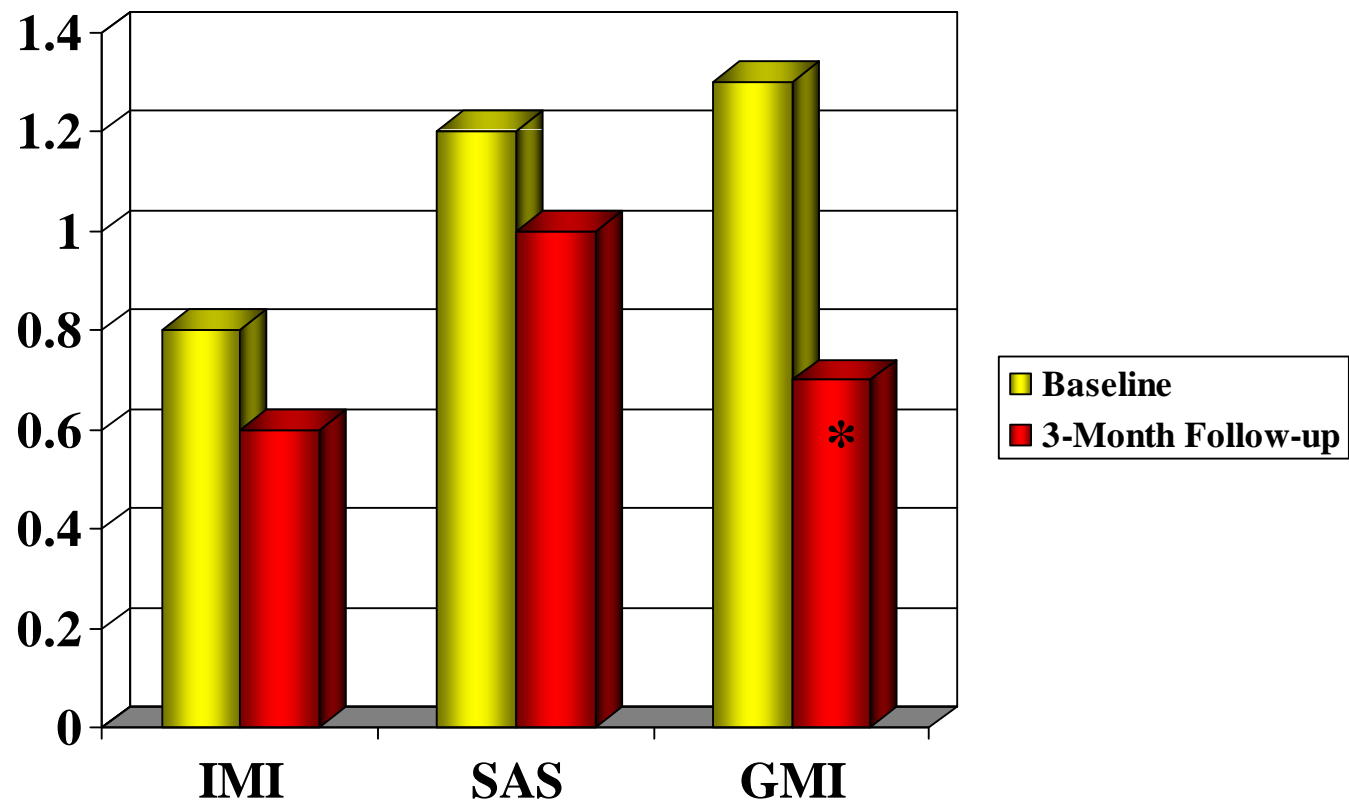
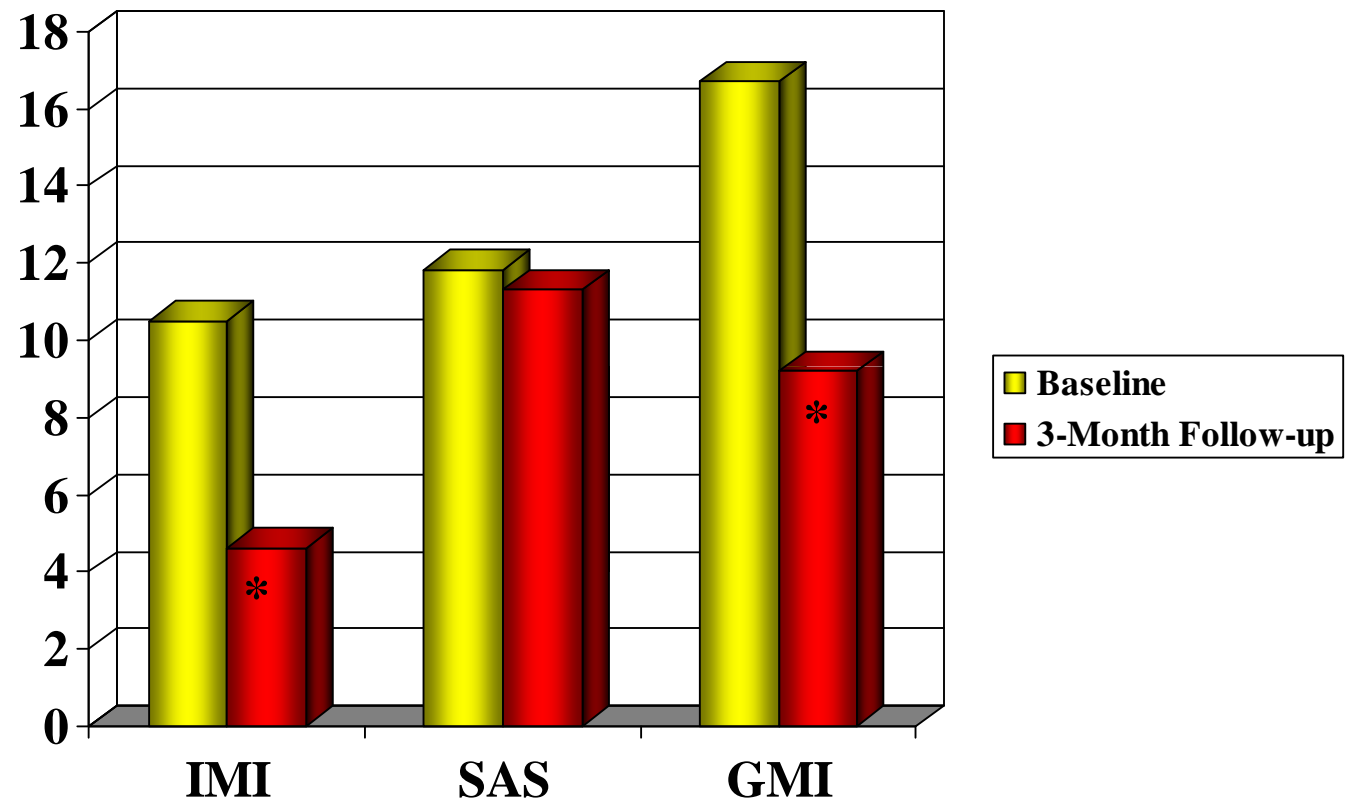# Change Rating:
Pre- and Post-Intervention
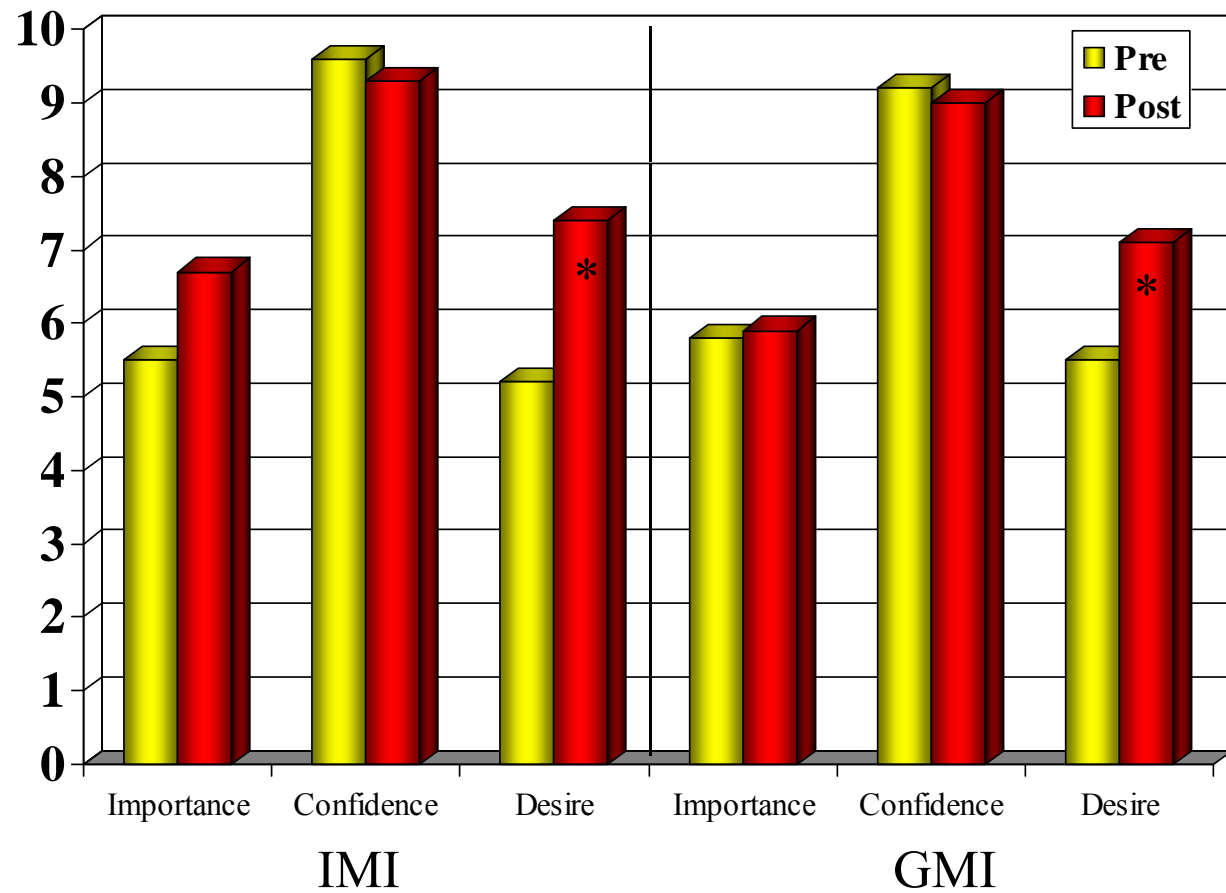
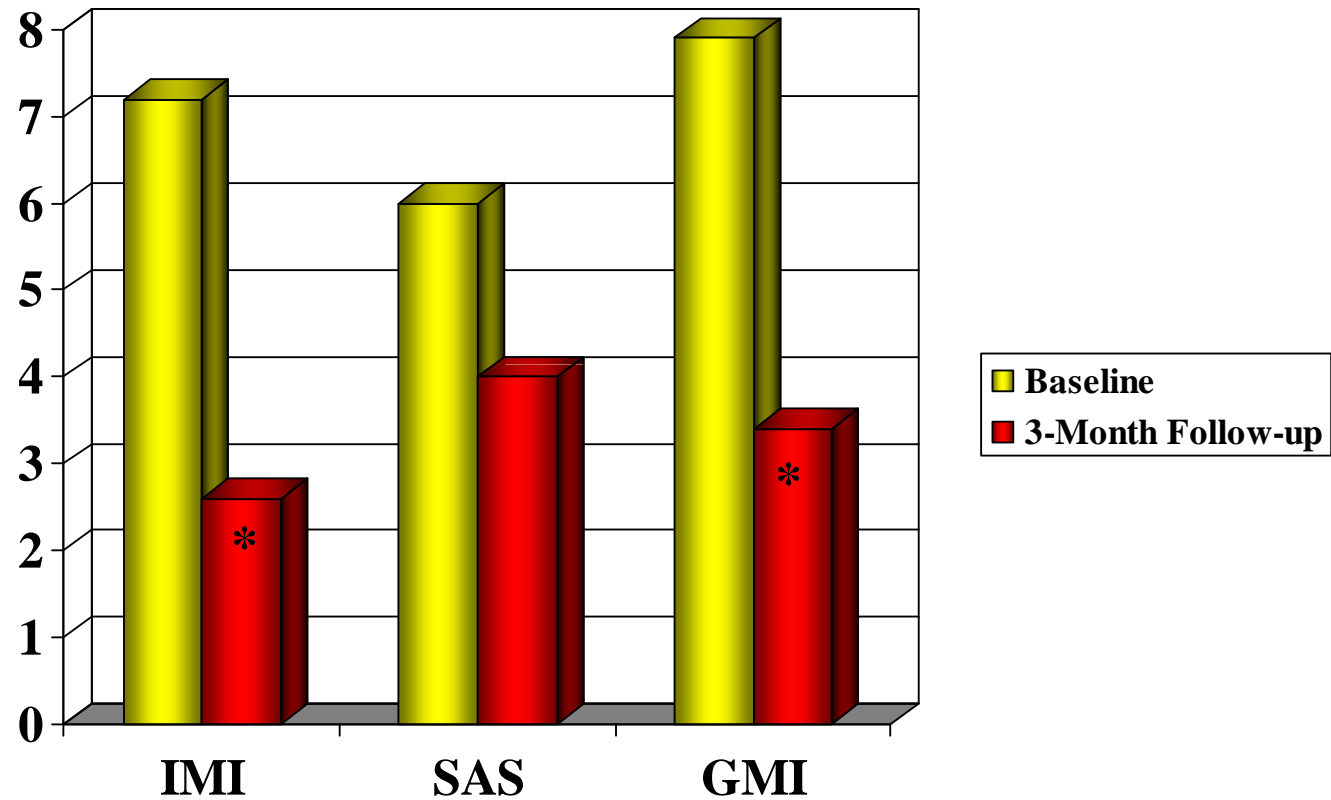# Number of Drinking Days
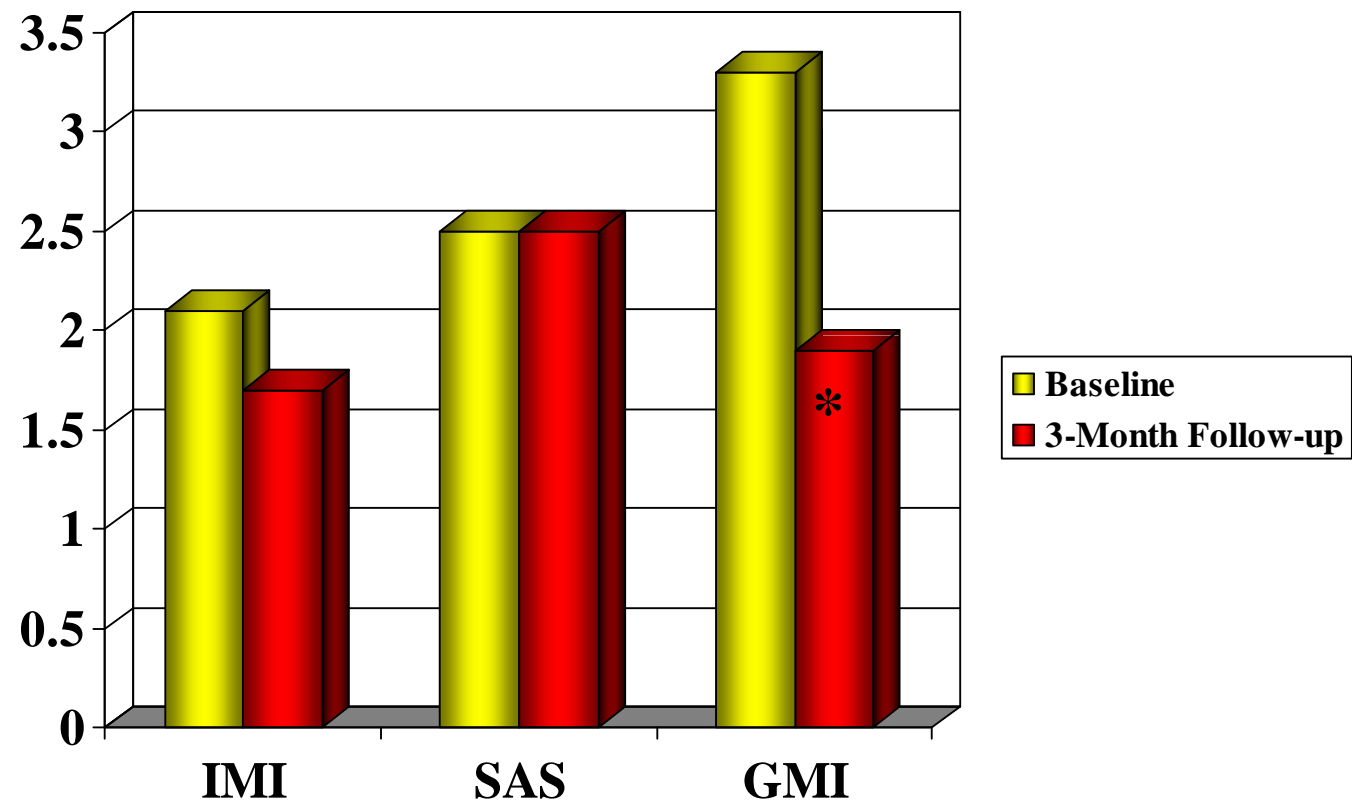
Average Drinks Per Week
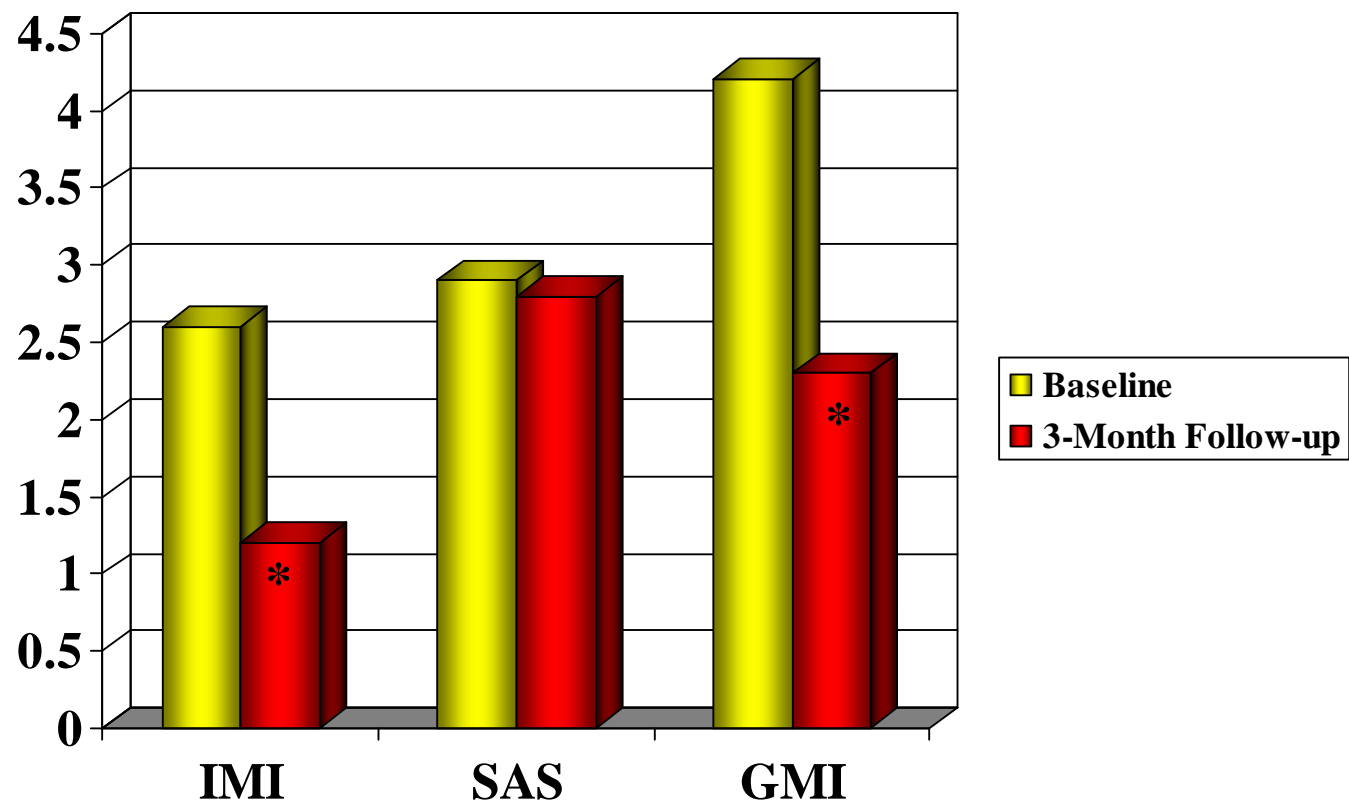
Number of Binge Drinking Days

Total Drinks Per Month

Maximum Drinks On Drinking Day

Summary

➢ Group Motivational Interventions are a cost effective way to provide treatment to a non-dependent population.

➢ Group and Individual MI were equally effective in reducing overall drinking and heavy drinking.

➢ Group and Individual MI were equally effective in increasing desire to change drinking.

Strengths/Limitations

- Strengths
  - Prospective
  - Randomized trial
  - Manualized intervention

- Limitations
  - Challenges with military sample
    - Deployment
    - PCS
    - Low follow-up rate
  - Differential session times
  - Self-selected sample

Mechanisms of Change - Mediators

- IMI
  - Decrease in Confidence associated with:
    - ✓ Decreased average drinks per episode at short-term follow-up
    - -- Perhaps were over-confident at first
- GMI
  - Increase in Desire associated with:
    - ✓ Decreased binge drinking days at short-term follow-up
    - -- Perhaps group discussion facilitated desire to change

Mechanisms of Change – Moderators (SOCRATES & RTCQ) – Overall

➢ Lower levels of Ambivalence and higher levels of Action associated with:

  ➢ Lower maximum number of drinks

  ➢ Lower binge drinking days

  ➢ Lower average drinks per episode

  ➢ Lower intoxication frequency

Mechanisms of Change – Moderators (SOCRATES) – by Intervention

- IMI
  - Higher levels of Taking Steps associated with:
    - ✓ Lower intoxication frequency

- GMI
  - Lower levels of Ambivalence associated with:
    - ✓ Lower intoxication frequency

- SAS
  - Higher levels of Taking Steps associated with:
    - ✓ Lower average drinks per episode
  - Lower levels of Ambivalence and higher levels of Problem Recognition associated with:
    - ✓ Lower binge drinking days

Motivational Interventions to Reduce Alcohol Use in a Military Population: The Cost-Effectiveness Component

Presented at

Community Behavioral Health Division Research Meeting
San Antonio, TX
July 10, 2008

Presented by

Alexander J Cowell, Ph.D.

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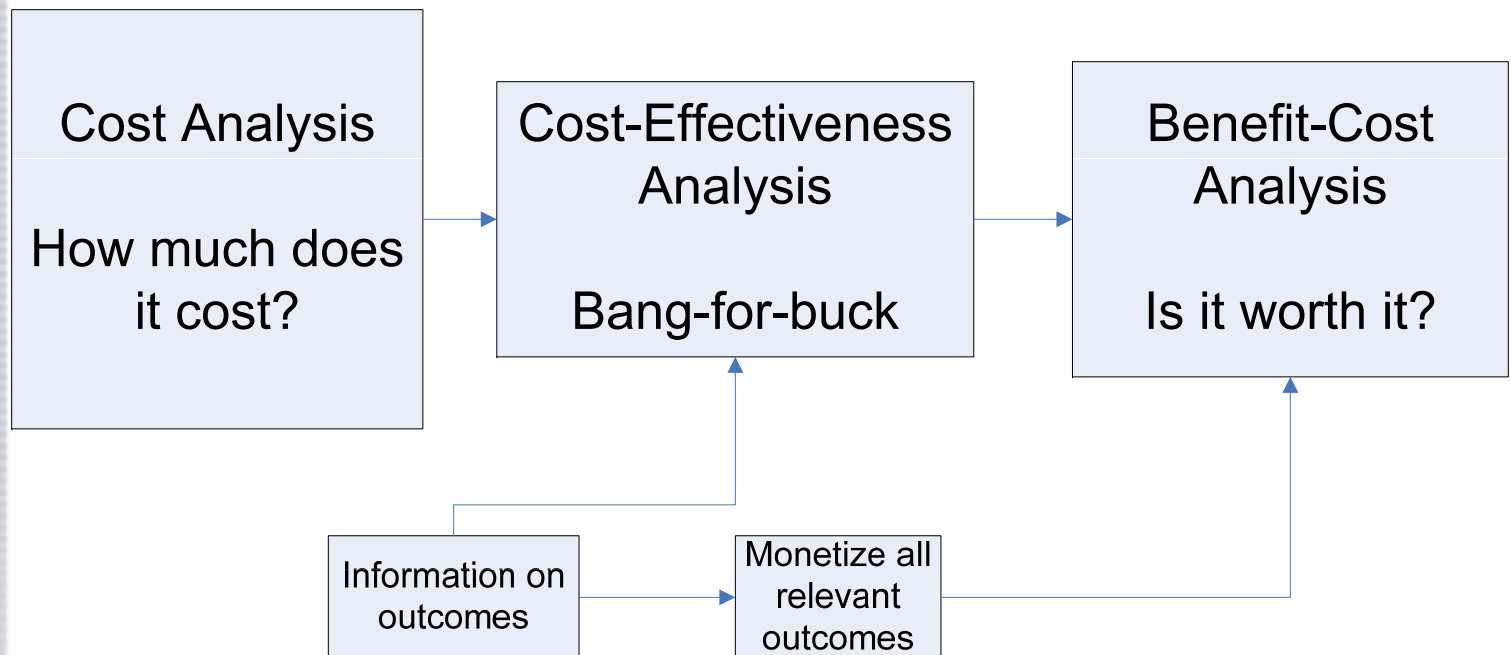
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Technical Objectives

- To assess the cost-effectiveness of the interventions
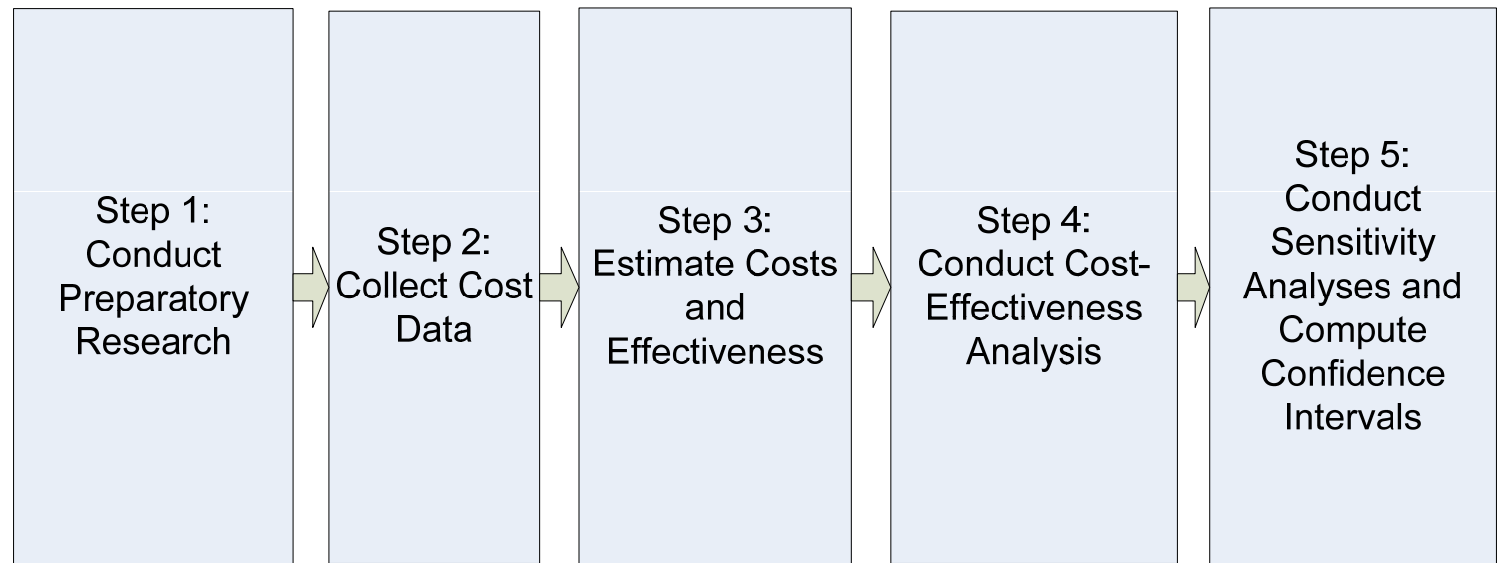
- Perspective = Air Force

What Is Cost-Effectiveness?

- Results describe trade-off between an improvement in the outcome and the cost required to achieve it, or

- How much does it cost to achieve a 1 unit improvement in the outcome, or

- "bang for buck" (really "buck per bang")

Where Cost-Effectiveness Fits With Other Cost Analyses

Cost Analysis

How much does it cost?

→

Cost-Effectiveness Analysis

Bang-for-buck

→

Benefit-Cost Analysis

Is it worth it?

Information on outcomes

Monetize all relevant outcomes

The Five Steps of Cost-Effectiveness Analysis

Step 1: Conduct Preparatory Research	Step 2: Collect Cost Data	Step 3: Estimate Costs and Effectiveness	Step 4: Conduct Cost-Effectiveness Analysis	Step 5: Conduct Sensitivity Analyses and Compute Confidence Intervals

Step 1: Conduct Preparatory Research

- ✓ Understand how resources are used in the intervention

- ✓ Design data collection instruments

- ✓ Collect start-up costs (e.g. training)

Step 2: Collect Cost Data

- ✓ Specifically designed quarterly instrument
  - Staff salaries
  - Which staff provide what intervention for how long
  - Space of intervention room

Step 3: Estimate Costs and Effectiveness

- ✓ Estimate cost per client for each intervention

- ✓ Estimate effectiveness of the interventions

Steps 4 and 5: Conduct Cost-Effectiveness Analyses and Conduct Sensitivity Analyses

- Choose one outcome of interest

- Estimate bang-for-buck

- Do for other outcomes of interest

- Sensitivity analyses

- Compute confidence intervals

Preliminary Results

Available Data

	Year 1				Year 2				Year 3
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1
Eglin	x	x	x	x	x	x	x		
Lakenheath	x	x	x						
Offutt	x	x	x	x	x	x	x	x	x
Sheppard							x	x	

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Direct and Indirect Labor Costs Per Session

- Labor costs broken down to hours spent delivering intervention and time spent preparing for intervention

- Across all 4 bases (Eglin, Lakenheath, Sheppard, and Offutt)

Intervention	Direct Labor Costs	Indirect Labor Costs
TAU	$141.43	$27.47
GMI	$43.68	$28.52
IMI	$30.24	$10.45

Average Cost Per Session

- Salary costs and space only

- Across all 4 bases (Eglin, Lakenheath, Sheppard, and Offutt)

Intervention	Cost
TAU	$171.71
GMI	$73.14
IMI	$41.02

Average Cost Per Participant

- Salary costs and space only

- Across all 4 bases (Eglin, Lakenheath, Sheppard, and Offutt)

Intervention	Cost
TAU	$17.44
GMI	$18.89
IMI	$41.02

Average Cost Per Participant By Base

- By base

- Salary costs and space only

Intervention	Sheppard	Eglin	L'heath	Offutt
TAU	$15.26	$22.60	$13.65	$18.24
GMI	$40.28	$10.86	$6.19	$18.24
IMI	$26.96	$34.56	$45.55	$57.02

Addressing Challenges

- Sensitivity analyses on loading up the salaries

- Main cost estimates <u>include</u> labor cost and space cost
  - Have reliable measures on these

- <u>Exclude</u> the following

- Best estimates of each will be used in sensitivity analyses
  - Food
    - About 150.00/month
    - Depends on rank
  - Housing
    - Depends on location and rank
  - Cost of living allowances (COLAs) if overseas

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Plans for Next 6 Months: Cost-Effectiveness Analysis

- Complete quarterly cost data

- Address challenges noted

Plans for Next Six Months: Preliminary Cost-Benefit Estimates

- Put dollar value on outcomes
  - Then compare cost to the (monetized) benefit

- Answer, "is a given intervention worth it?"

Summary of Cost Component

- Have preliminary cost estimates of the intervention

- Expected variation of estimates across intervention arms
  - Variation across bases
  - Variation by who does what

- Identified next steps

- Comments or questions?

My Questions to the Group

How to use and report RVUs?

1. In hours or in increments of hours?

    1. E.g.1 – site X: 96153 "24 x 15 min units"

    2. E.g.2 – site Z: 99402 "0.4 RVU's per/unit"

2. In dollars?

    Estimate = $73/RVU in FY2008

How to use and present RVU's? (cont'd)

- Is an RVU fungible?

- E.g. Site X reports the following
  - For TAU (SAS) use 96153; 24x15 min units = 6 hours
  - For GMI use 99412; 2x15 min units = 30 mins
  - So what is the 'value' of 1 TAU + 1 GMI at site X?
    - 6 hours and 30 mins?

A Preview of ICER

- Example of TAU and GMI

- ICER = $\Delta\text{Cost}_{TAU,GMI}$ / $\Delta\text{Effectiveness}_{TAU, GMI}$

E.g. of # Binge Days

	TAU	GMI	IMI
Baseline	6	7.9	7.2
3-Month f/u	4	3.4	2.6
cost rank	1	2	3
Incremental cost (Δ cost)		+$1.45	+$22.13
Period-period change	-2	-4.5	-4.6
P-p change as a %	-33%	-57%	-64%
Incremental % point change (Δ effectiveness)	-	-24%	-7%
Incremental cost (Δ cost)	-	+$1.45	+$22.13
ICER =	-	$0.06	$3.16

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Limitations

- **Preliminary analyses**

- **Not adjusted for potential confounds**

- **Need to be expressed in more meaningful units of effectiveness**
  - E.g. # of days binge drinking rather than percentage point change

- Will need to pick 1 or 2 of the several outcomes
  - Avoids potentially confusing results

Motivational Interventions to Reduce Alcohol Use in a Military Population

Presented *at:*
Community Behavioral Health Division Research Meeting
San Antonio, TX
July 10, 2008

Funded by: DoD DAMD17-04-1-0072

PIs: Janice M. Brown, Maj. Nicole Frazer

Co-I: Alexander Cowell,

Project Coordinator: Barry D. Weaver

P.O. Box 12194 · 3040 Cornwallis Road · Research Triangle Park, NC 27709
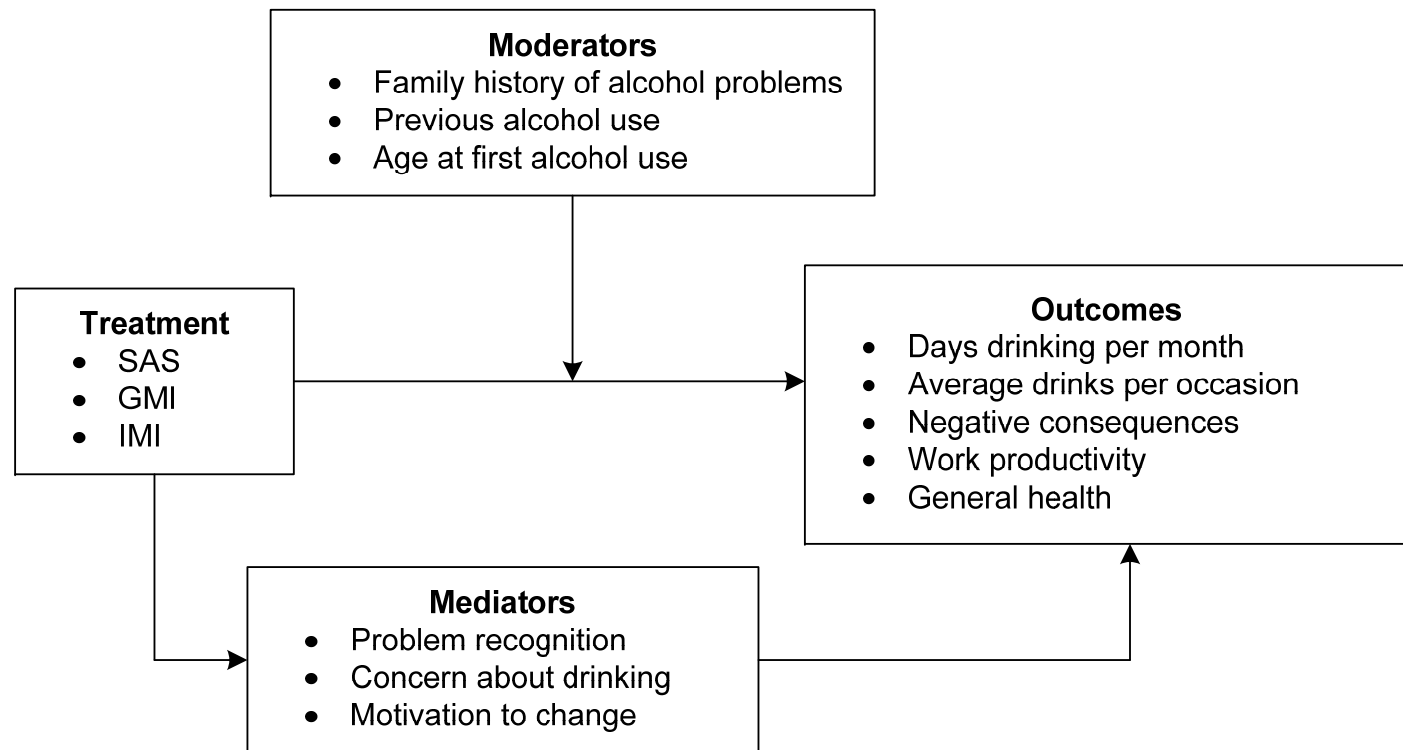Phone: 520-544-5764 · Fax: 520-297-1810 · jmbrown@rti.org · www.rti.org

Technical Objectives

➢ To evaluate the effectiveness of two motivational interventions with Air Force personnel referred to Alcohol and Drug Abuse Prevention and Treatment (ADAPT) program for screening.

➢ To compare Group and Individual Motivational Interventions (GMI and IMI) with each other and with the Substance Abuse Seminar (SAS) currently offered.

➢ To test mediators and moderators of the interventions' effects.

Model of Intervention Effects

Moderators
- Family history of alcohol problems
- Previous alcohol use
- Age at first alcohol use

Treatment
- SAS
- GMI
- IMI

Outcomes
- Days drinking per month
- Average drinks per occasion
- Negative consequences
- Work productivity
- General health

Mediators
- Problem recognition
- Concern about drinking
- Motivation to change

Individual Motivational Intervention (IMI)

- ➢ Individual format
- ➢ Based on Miller & Rollnick principles
- ➢ Manualized intervention
- ➢ Tape recorded session
- ➢ Alcohol use, problems, solutions
- ➢ No feedback provided
- ➢ .75 to 1-hour session

Group Motivational Intervention (GMI)

- Group format
- Group dynamics
  - Group polarization
  - Production blocking
  - Social Loafing
- Manualized intervention
- Tape recorded session
- Alcohol use, problems, solutions
- No feedback provided
- 2 to 2.5-hour session

Group Dynamics

➤ **Group polarization**

- Actively seek alternative viewpoints
- Allow for different goals
- Reframe

➤ **Production blocking**

- Generate multiple ideas
- Allow each member to start a discussion
- Decrease waiting period

➤ **Social Loafing**

- Increase the identifiability of contributions
- Enhance cohesiveness
- Personal involvement

Substance Abuse Seminar (SAS)

- ➢ Group format
- ➢ Air Force standard
- ➢ Education and information
- ➢ Multiple speakers
- ➢ No feedback provided
- ➢ 6- to 8-hour session

Enrollment

- **Eglin 86**
  - IMI = 28
  - GMI = 22
  - TAU = 36

- **Offutt 92**
  - IMI = 31
  - GMI = 27
  - TAU = 34

- **Tinker 0**

- **Lakenheath 20**
  - IMI = 7
  - GMI = 5
  - TAU = 8

- **Sheppard 103**
  - IMI = 36
  - GMI = 30
  - TAU = 37

- **Travis 0**

Demographic Data

Gender

	Male	81.3%
	Female	18.7%

Marital Status

	Married	27.1%
	Single	61.7%
	Sep/Div	11.2%

Family History (Alcohol)   44.6%

Age   26.7 (19-43)

Demographic Data (cont.)

Education

GED or less	2.9%
H.S. Graduate	85.4%
Associate Degree	8.8%
Bachelor's Degree	2.9%

Paygrade

E1 – E3	48.6%
E-4 – E7	47.3%
O1 – O3	4.1%

Baseline Alcohol Use – Past 30 Days

Number of Drinks per Drinking Day

1 to 2	11.5%
3 to 4	42.7%
5 to 6	25.0%
7 to 8	7.3%
9 to 10	5.2%
11 or More	8.3%

Number of Drinks on Heaviest Drinking Day

1 to 2	8.3%
3 to 4	26.0%
5 to 6	29.2%
7 to 10	20.8%
11 to 15	9.4%
16 to 22	6.3%

Baseline Alcohol Use – Past 30 Days

Drinks per Week

1 to 4	76.0%
5 to 7	16.7%
8 or More	7.3%

**Heavy Days during
   Past 30 Days***

0	35.0%
1 to 2	53.0%
3 to 4	11.0%
5 or More	1.0%

Number of Drinking Days during Past 30 Days

1 to 2	58.3%
3 to 4	29.2%
5 to 6	10.4%
7 or More	2.1%

Alcohol Use Disorders Identification Test (AUDIT)

➢ Non-Problem Drinking 80.3%

 • AUDIT score <8

➢ Hazardous Drinking 16.9%

 • AUDIT score 8-15

➢ Harmful Drinking 2.8%

 • AUDIT score 16-19

➢ Possible Dependence 0.0%

 • AUDIT Score ≥20

Reason for Referral
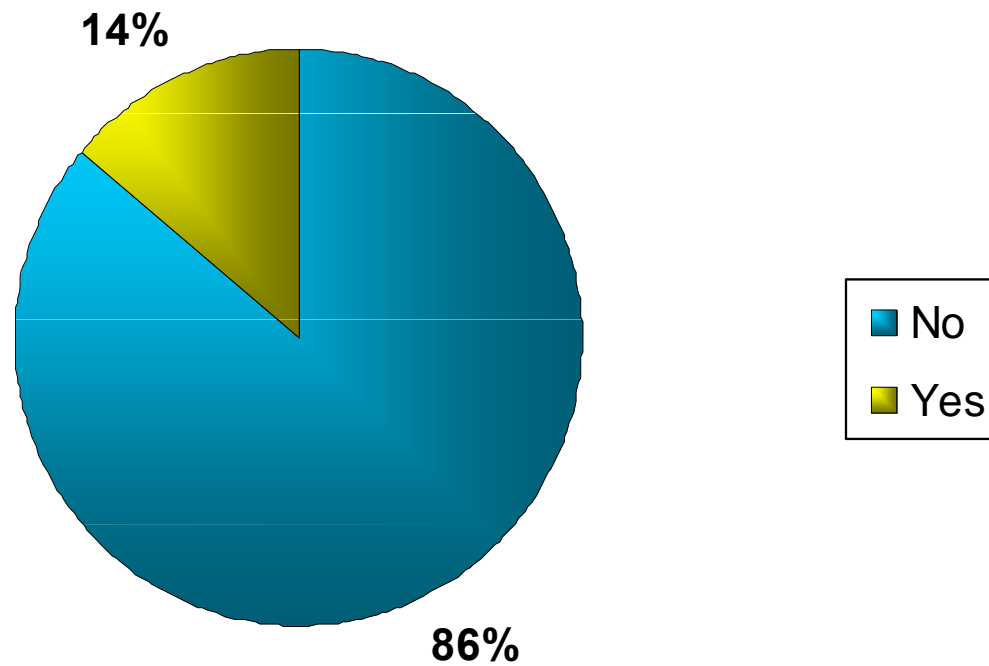
Referral Incident: Alcohol Quantity

28%

43%

29%

- 4 or fewer drinks
- 5 to 9 drinks
- 10 or more drinks

Referral Incident:
Specific On-Base Location

Pie chart legend:
- Dorms (green) — 60%
- My Home (yellow) — 13%
- In a Car (red) — 9%
- Club (blue) — 9%
- Other (purple) — 9%
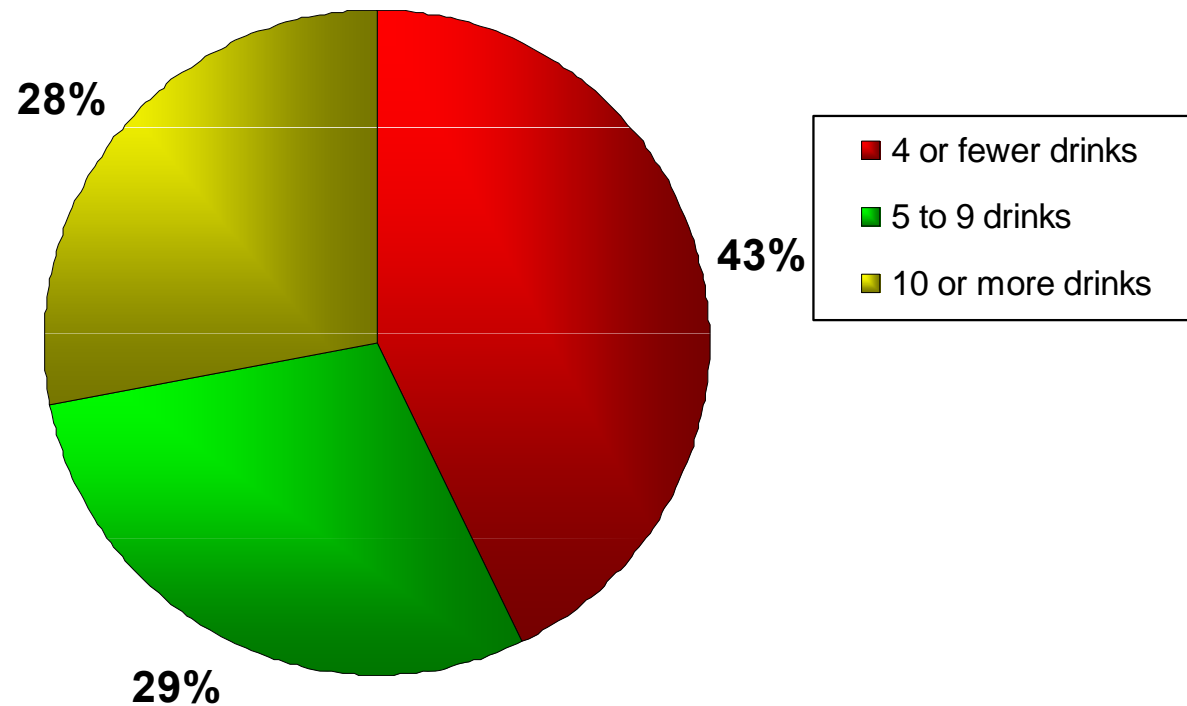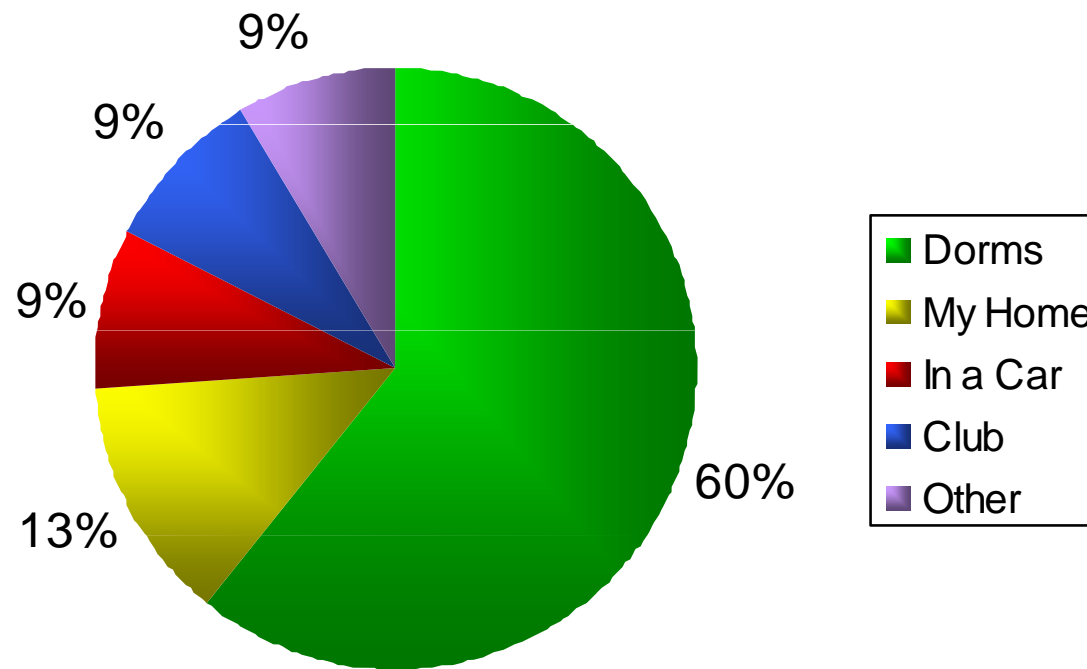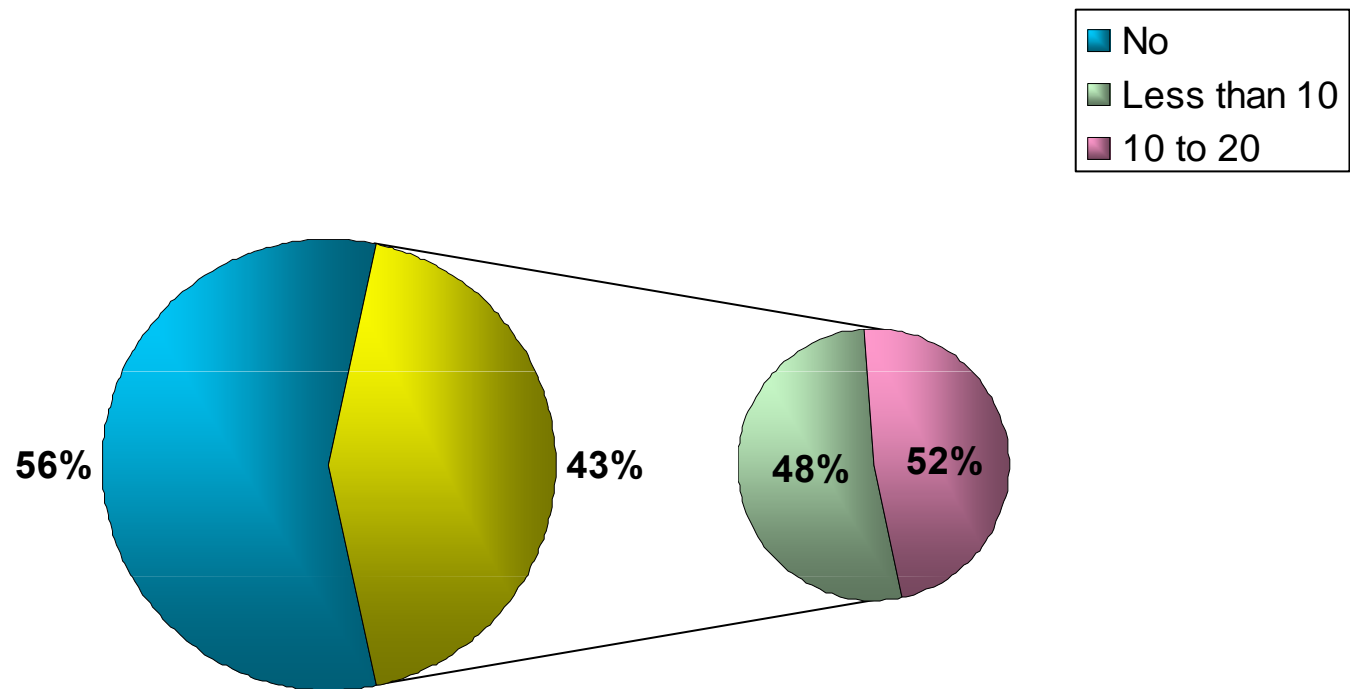
Cigarette Use

Smokeless Tobacco Use

Productivity Loss (Days)

6%   4%

11%

79%

Legend:
- 0 Days
- 1 Day
- 2 to 3 Days
- 4 to 5 Days
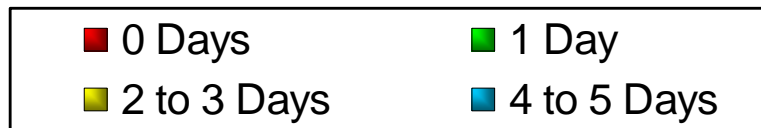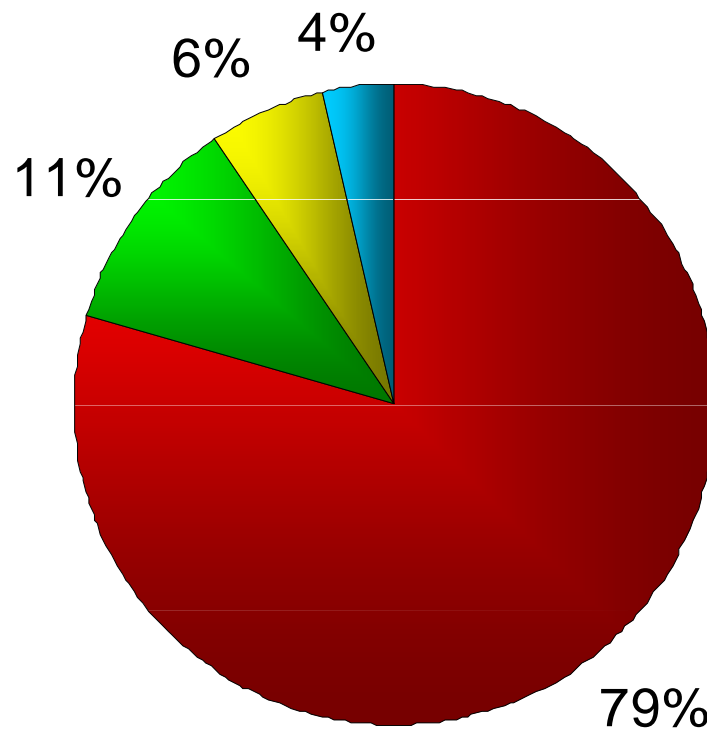
Perceived Norms

Reported the perception that more than 50% of permanent party personnel are engaging in behavior.

- Drink regularly   72% ↑
- Get drunk on weekends   44% ↑
- Smoke cigarettes regular   31% ↓
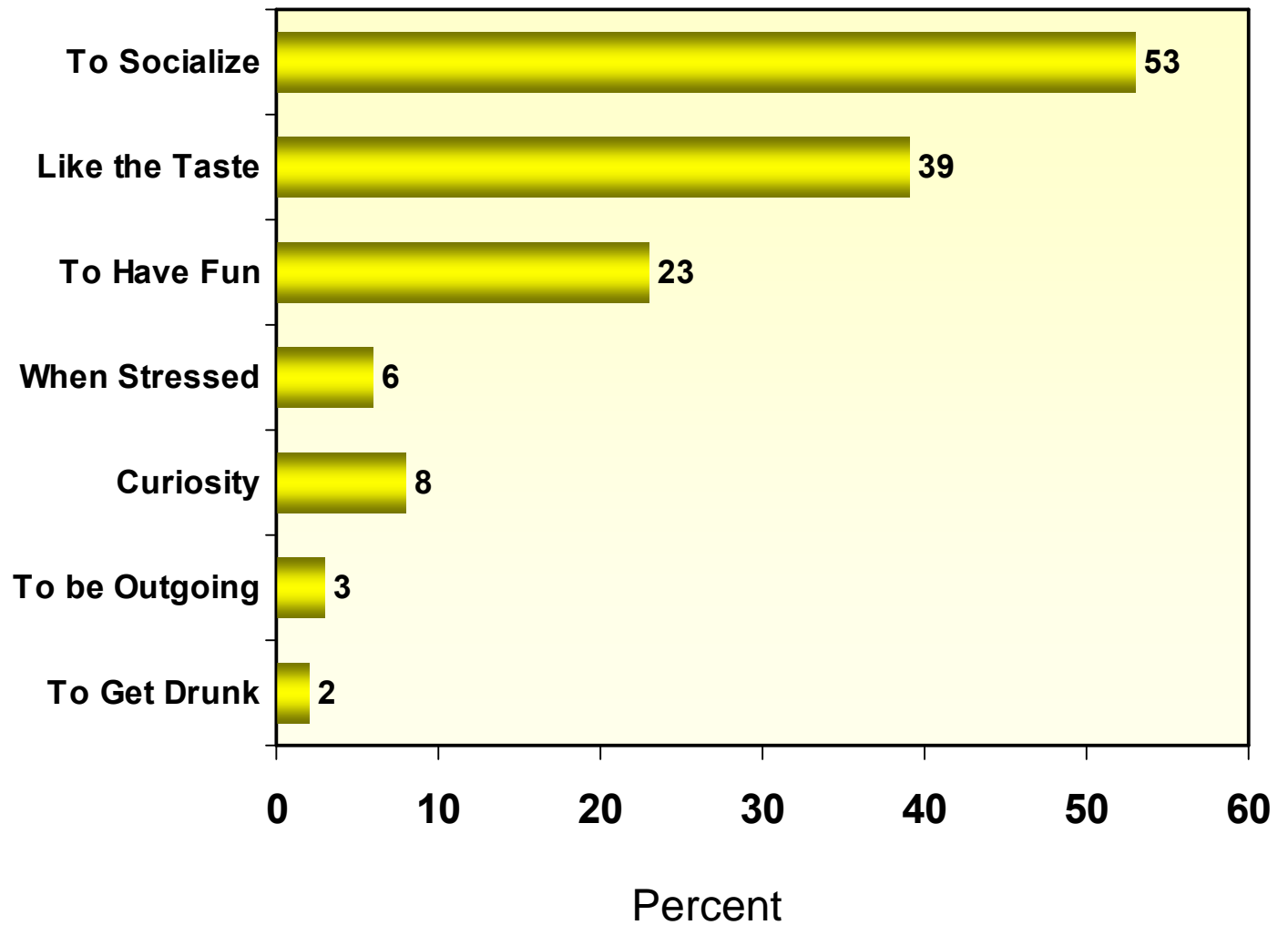- Use smokeless tobacco   13% ⟷

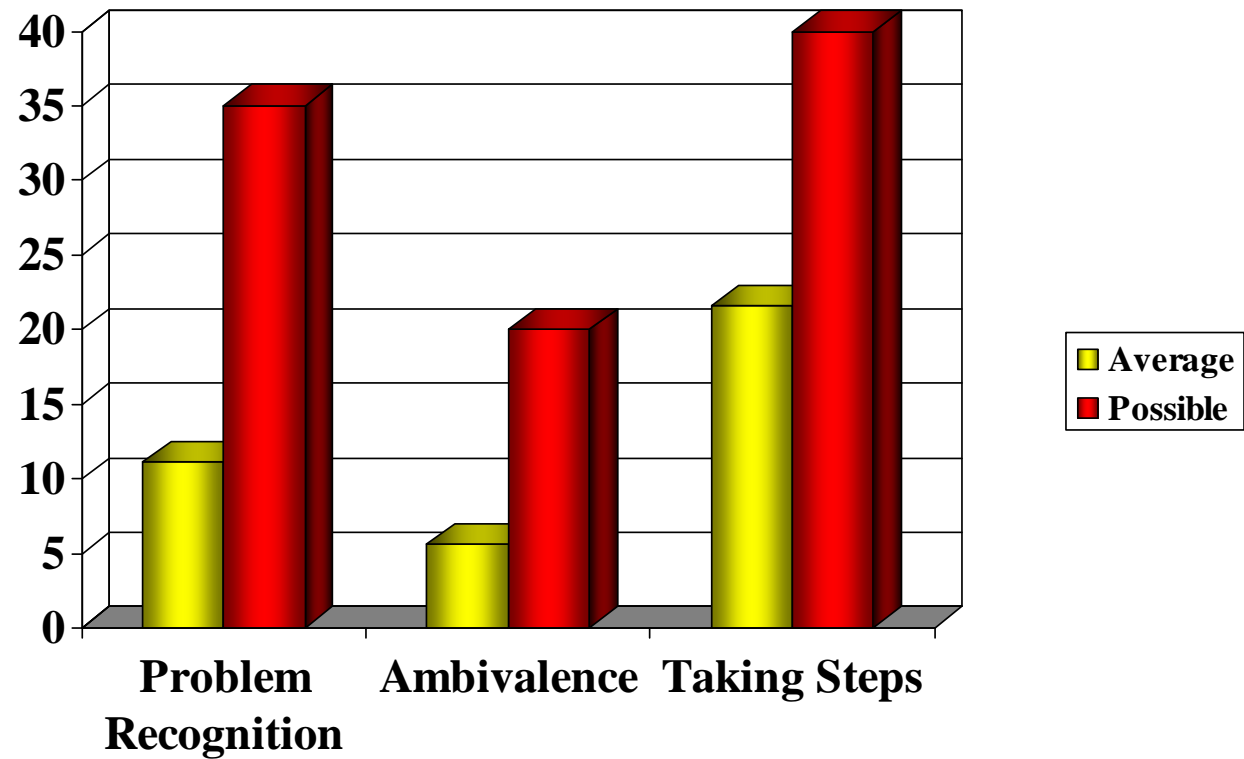(Note: arrows denote changes in percentages from presentation in 2007)

Cultural Perceptions

➢ Hard to fit in   5.6%

➢ Drinking is part of unit   5.7%

➢ Drinking is part of military   19.8%

➢ Only recreation available   9.4%

➢ Encouraged to drink   10.4%

➢ Non-alcoholic beverages   69.8%
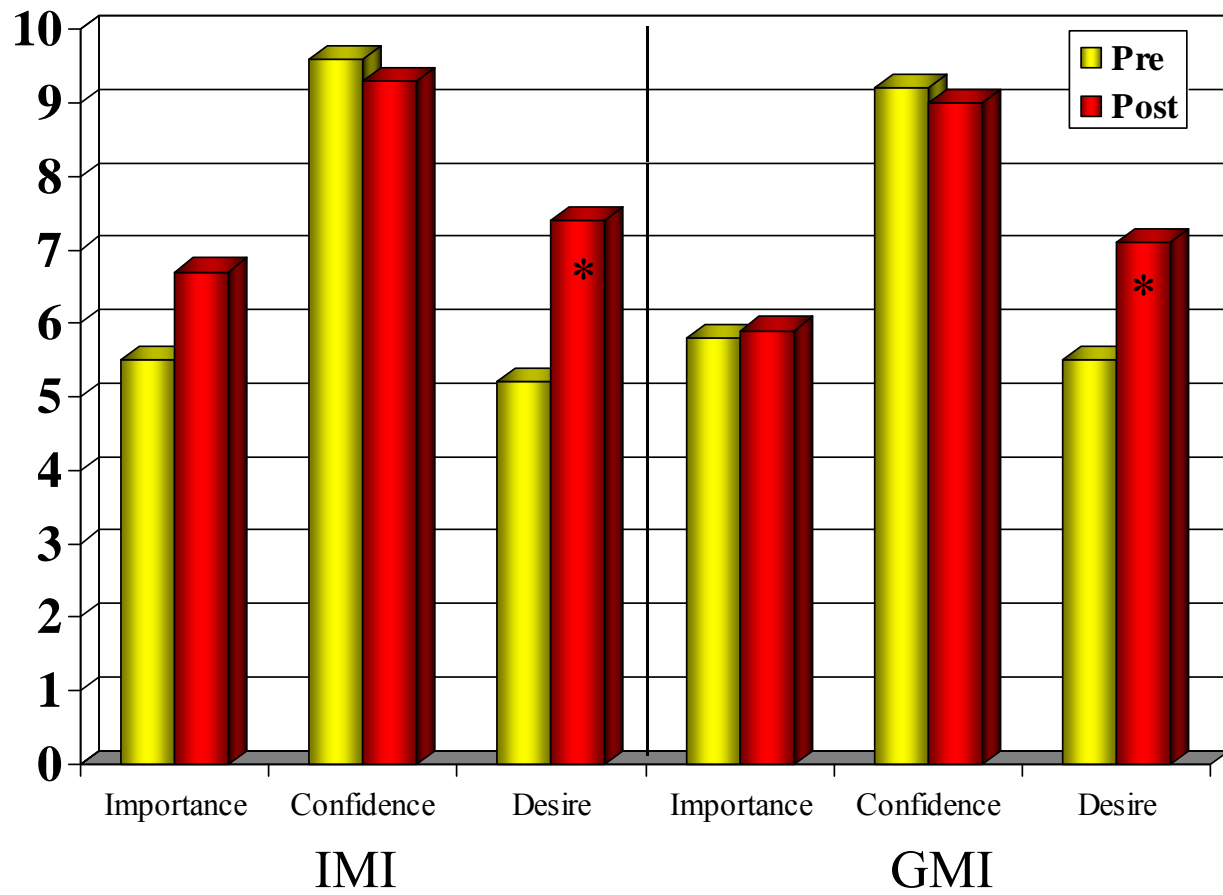
     are always available

Reasons for Drinking

Reason	Percent
To Socialize	53
Like the Taste	39
To Have Fun	23
When Stressed	6
Curiosity	8
To be Outgoing	3
To Get Drunk	2

Percent

Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES)

Change Rating:
Pre- and Post-Intervention

Follow-up Rates by Condition

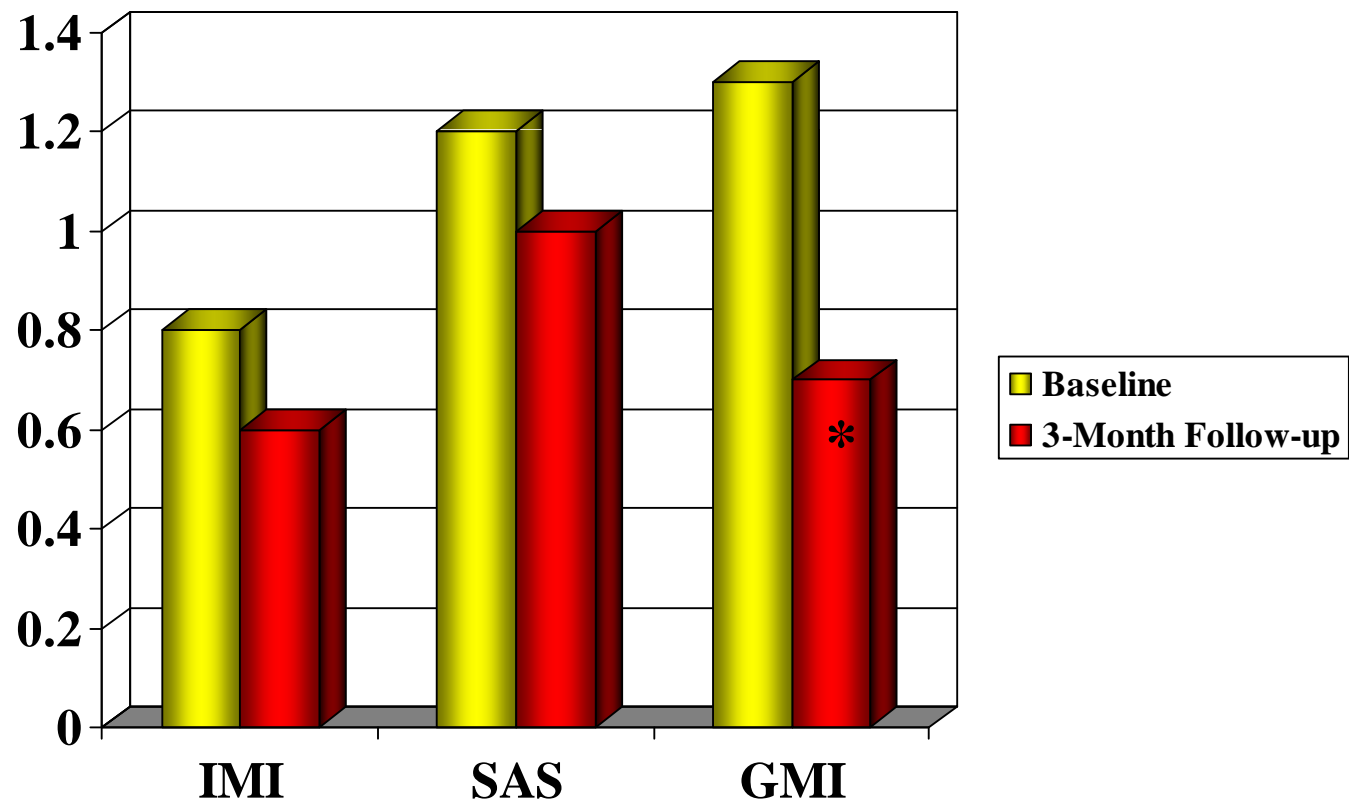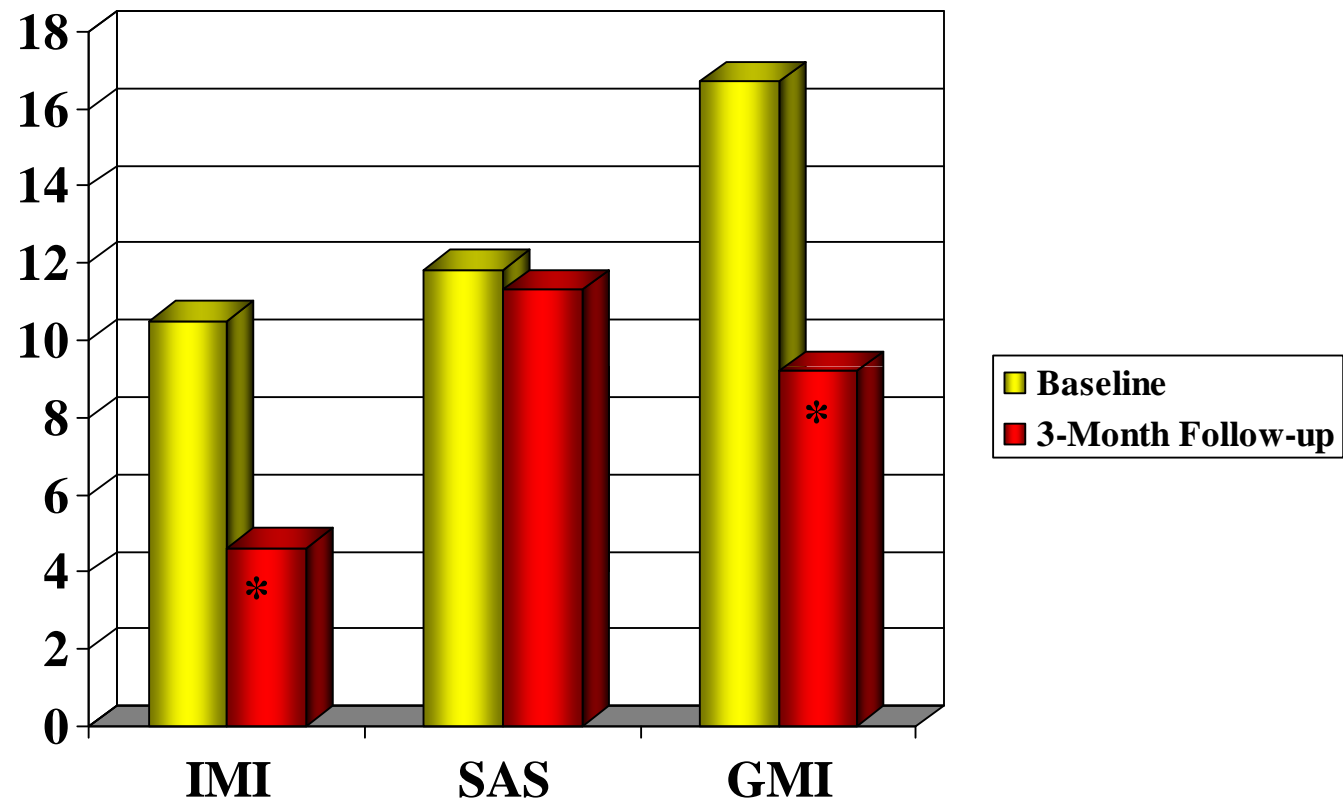|	Baseline	Follow-up	%
IMI	102	39/92	42%
SAS	115	39/104	38%
GMI	84	37/74	50%
OVERALL	**301**	**111/270**	**41%**
-3 month		92/270	34%
-6 month		65/233	29%
-12 month		35/166	21%

Number of Drinking Days
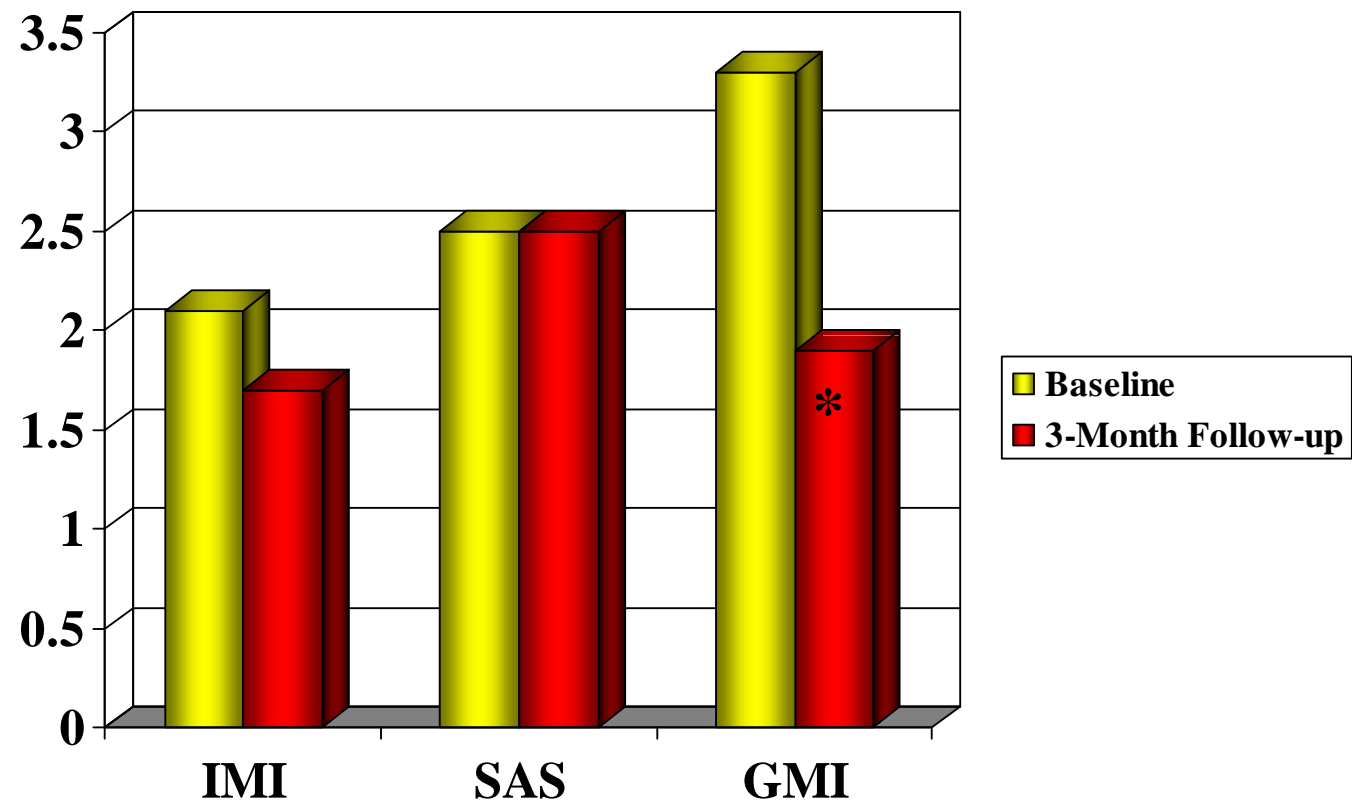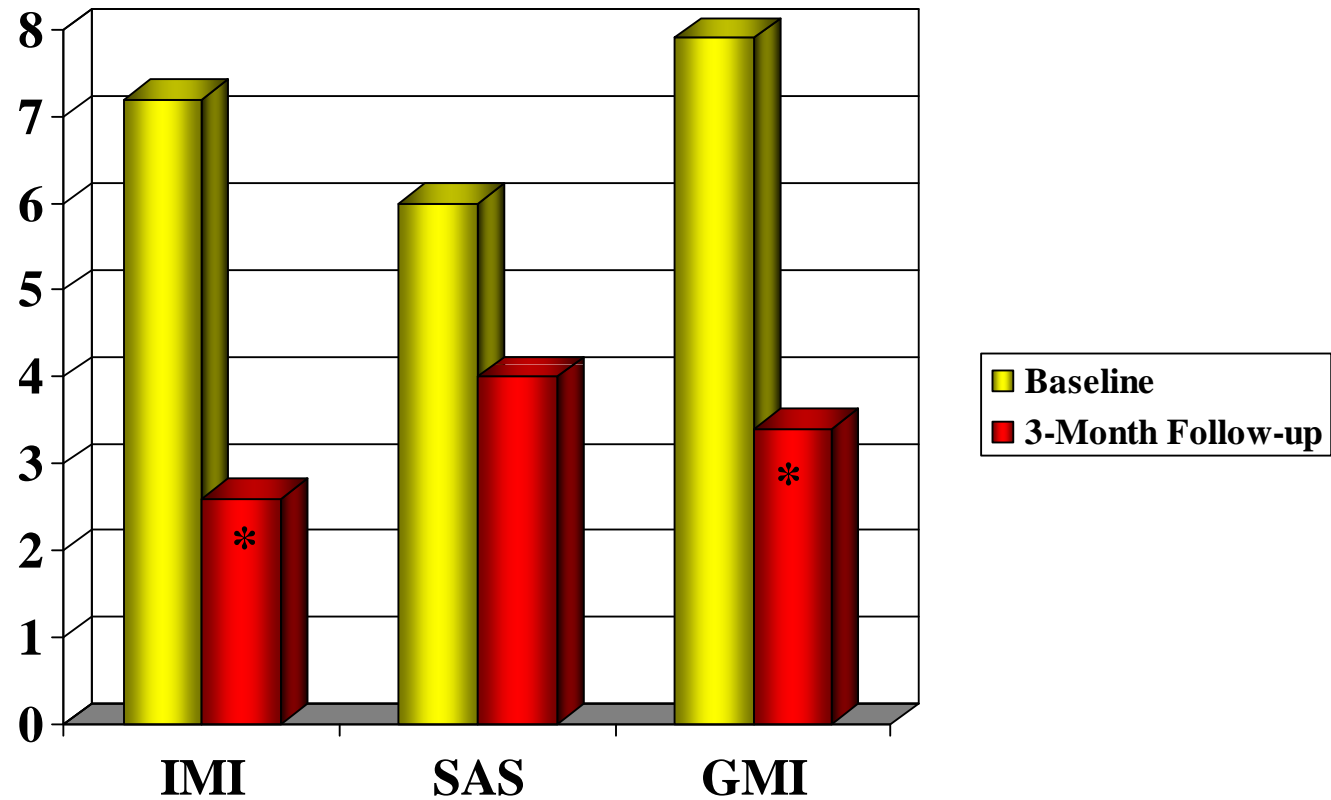
Average Drinks Per Week
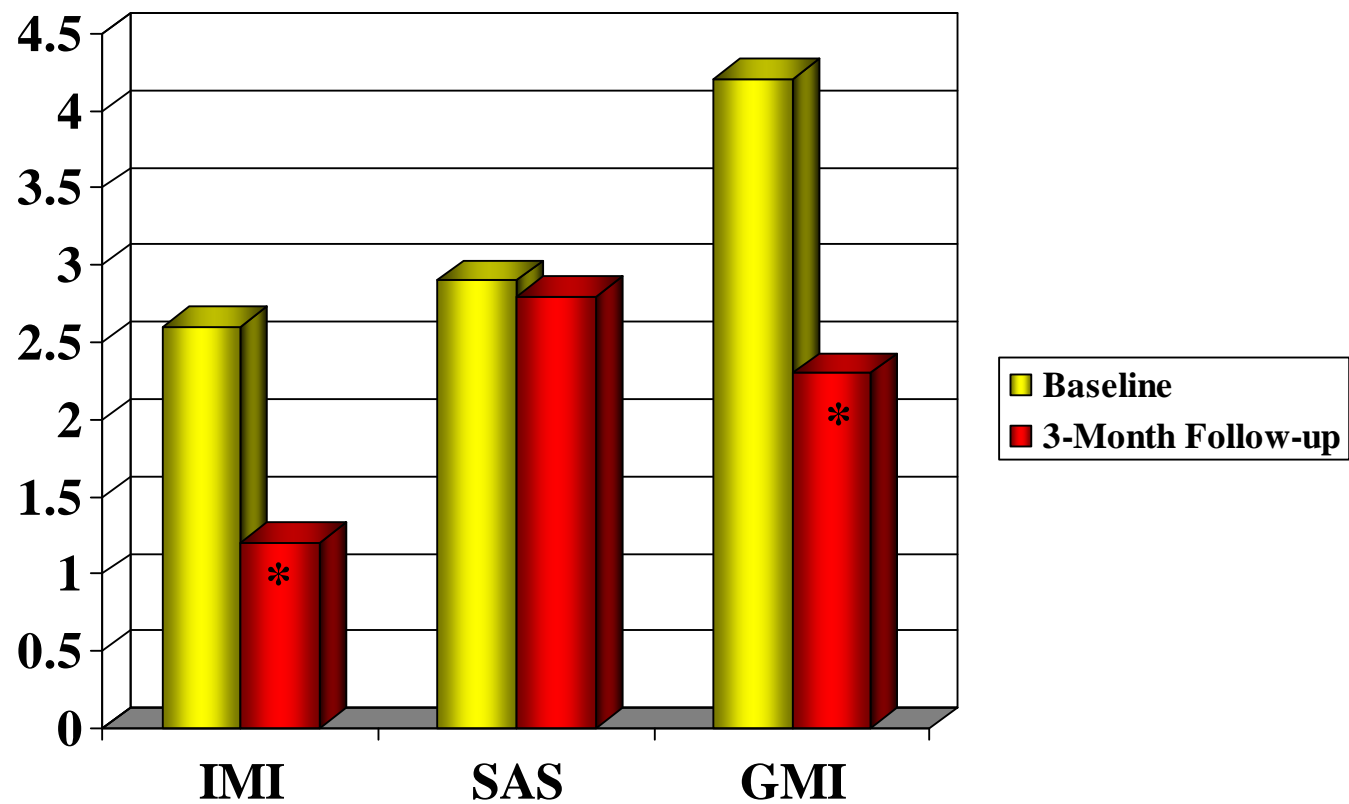
Number of Binge Drinking Days

Total Drinks Per Month

Maximum Drinks On Drinking Day

Mechanisms of Change - Mediators

- IMI
  - Decrease in Confidence associated with:
    - ✓ Decreased average drinks per episode at short-term follow-up
    - -- Perhaps were over-confident at first
- GMI
  - Increase in Desire associated with:
    - ✓ Decreased binge drinking days at short-term follow-up
    - -- Perhaps group discussion facilitated desire to change

Mechanisms of Change – Moderators (SOCRATES) – Overall

➤ Lower levels of Ambivalence associated with:

  ➤ Lower maximum number of drinks

  ➤ Lower binge drinking days

  ➤ Lower average drinks per episode

  ➤ Lower intoxication frequency

Mechanisms of Change – Moderators (SOCRATES) – by Intervention

- ➢ IMI
  - Higher levels of Taking Steps associated with:
    - ✓ Lower intoxication frequency

- ➢ GMI
  - Lower levels of Ambivalence associated with:
    - ✓ Lower intoxication frequency

- ➢ SAS
  - Higher levels of Taking Steps associated with:
    - ✓ Lower average drinks per episode
  - Lower levels of Ambivalence and higher levels of Problem Recognition associated with:
    - ✓ Lower binge drinking days

Summary

➤ Group Motivational Interventions are a cost effective way to provide treatment to a non-dependent population.

➤ Group and Individual MI were equally effective in reducing overall drinking and heavy drinking.

➤ Group and Individual MI were equally effective in increasing desire to change drinking.

Challenges

- SUAT – challenges with getting data

- Low follow-up rate
  - combine 3, 6, and 12?
  - 19 participants with 6 month FU as their 1st follow-up
  - 3 participants with 12 month FU as their 1st follow-up

- ADAPT staff turnover

- Slow recruitment

Plans for Next Six Months

➢ End enrollment – end of July

➢ Continue to work on improving follow-up rates

➢ Continue to clean, edit, and analyze data

➢ Close out project – end of February

Motivational Interventions to Reduce Alcohol Use in a Military Population

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Technical Objectives

- To compare Group and Individual Motivational Interventions (GMI and IMI) with each other and with the Substance Abuse Seminar (SAS).

- To test mediators and moderators of the interventions' effects.

Average Drinks Per Week
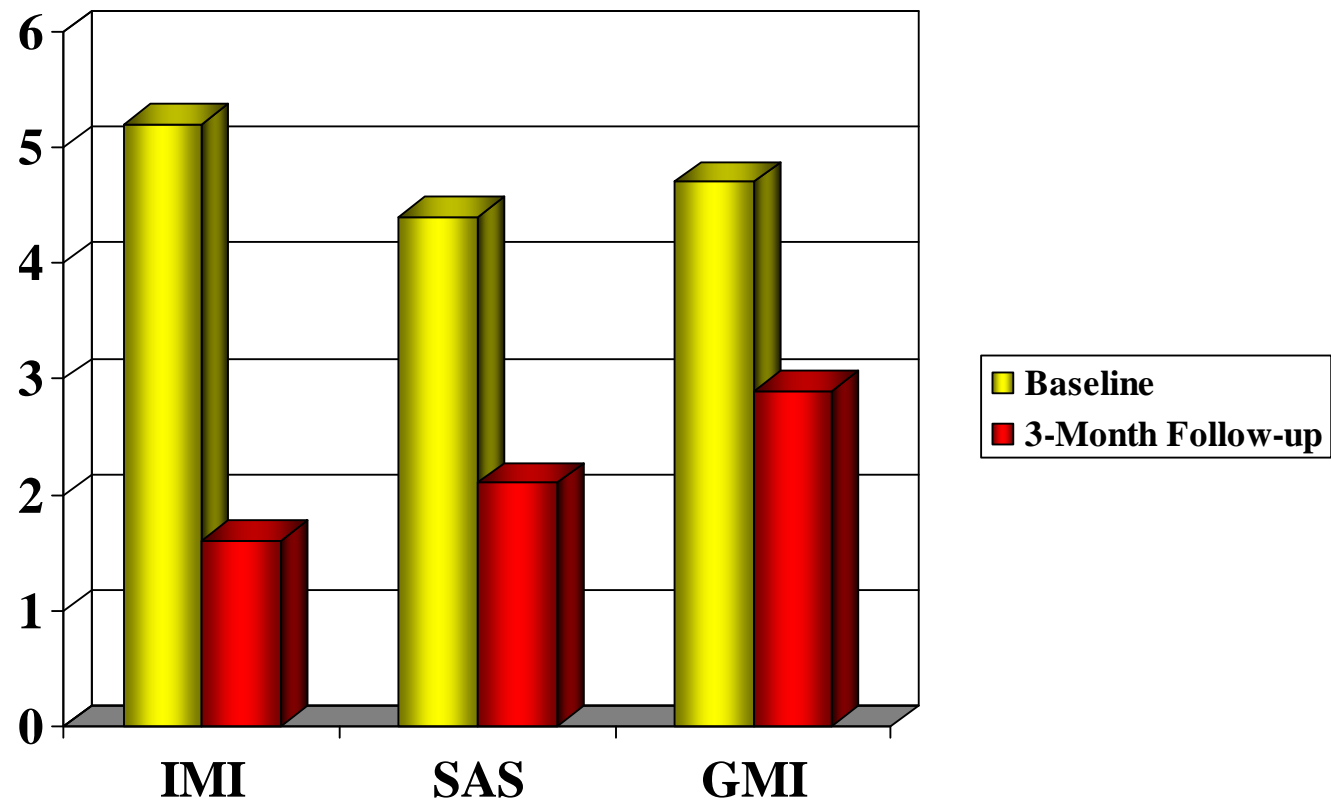
Number of Binge Drinking Days
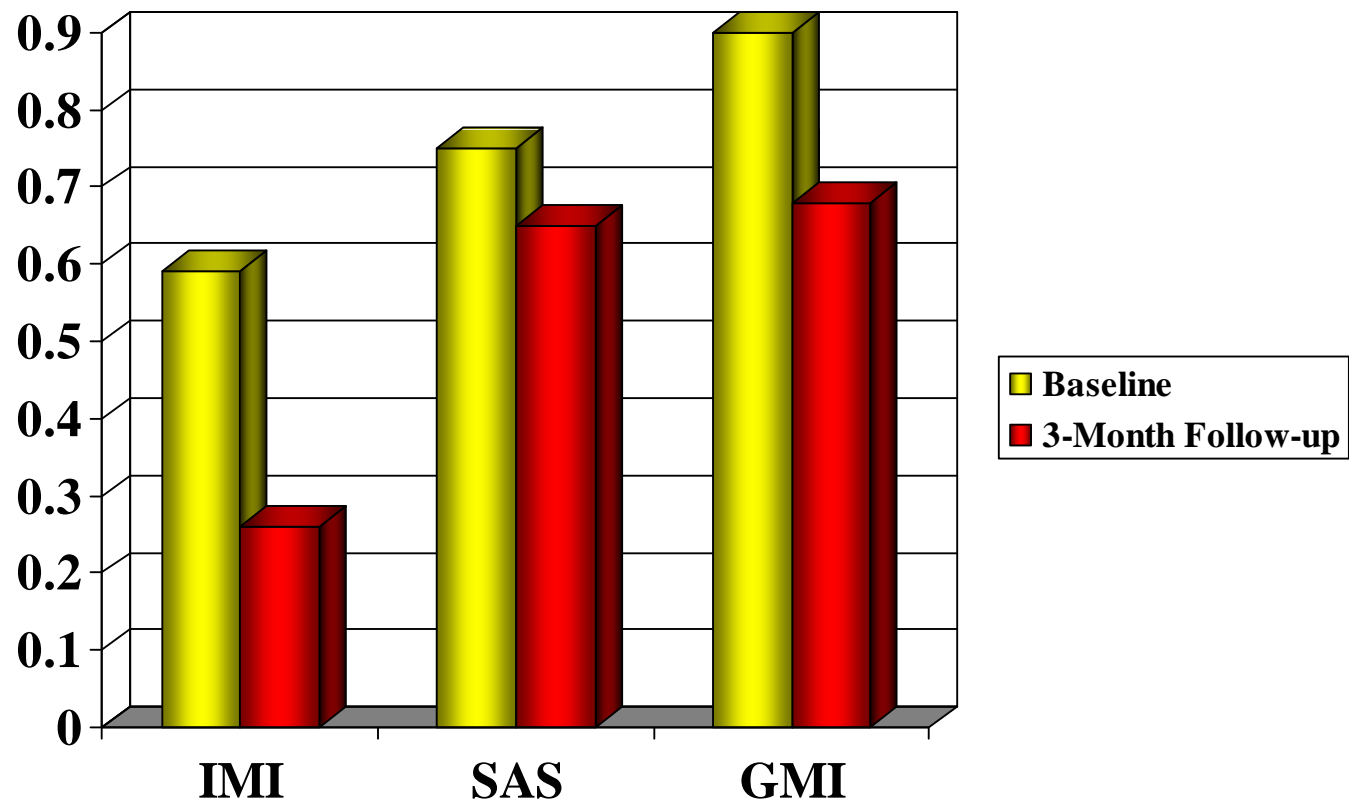
Maximum Drinks On Drinking Day
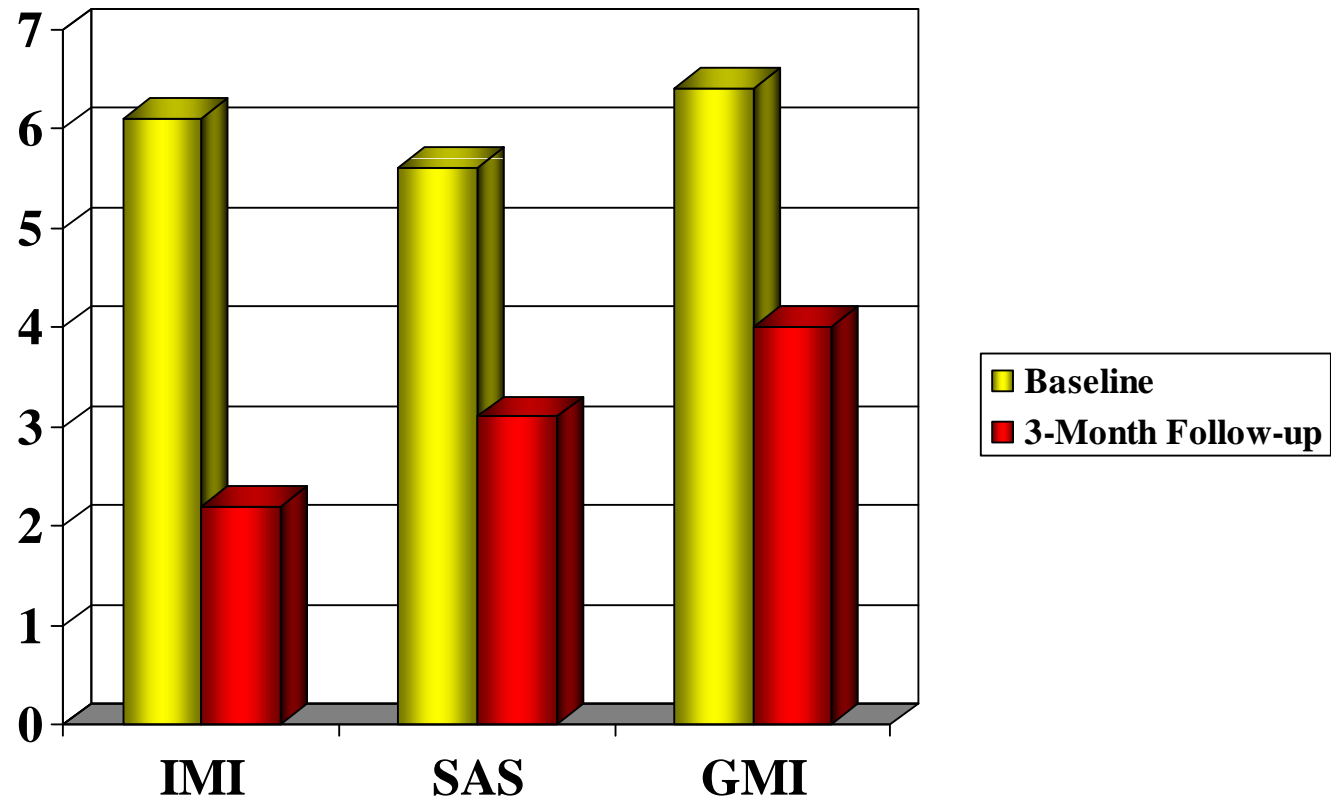
Decrease in Binge Drinking Days from Baseline to 3-month Follow-up

Distribution of Wilcoxon Scores for IBINGEDIFF

Decrease in Maximum Drinks from Baseline to 3-month Follow-up

Distribution of Wilcoxon Scores for IMAXDXDIFF
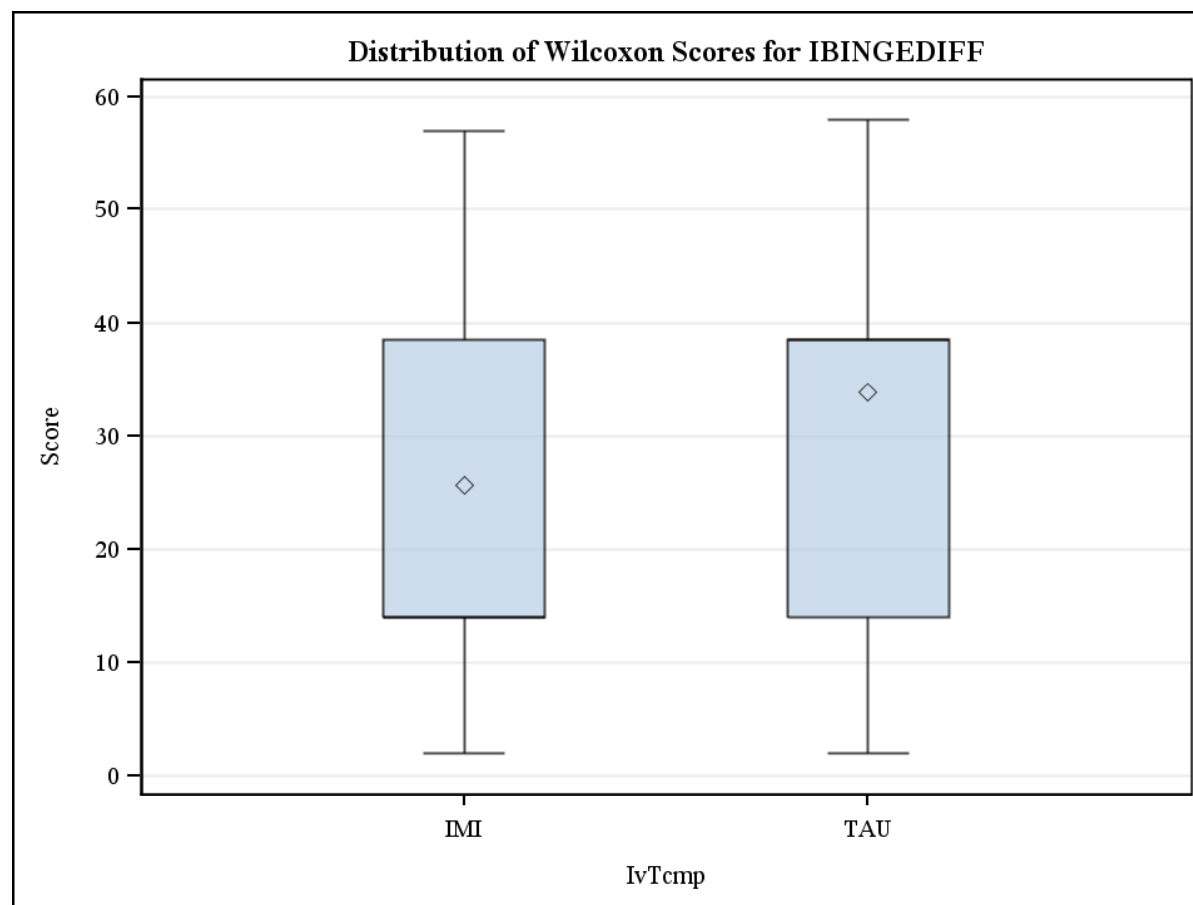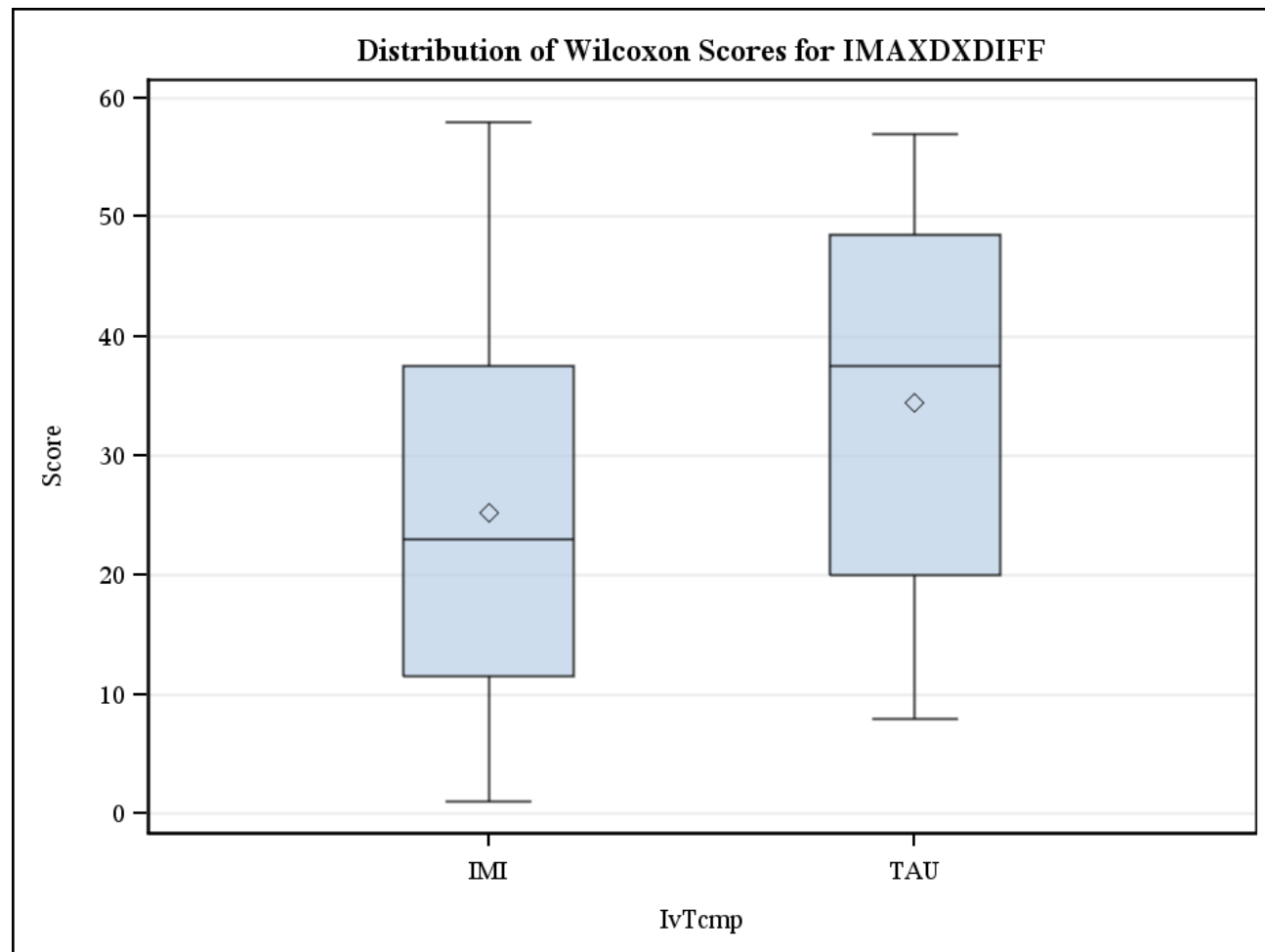
Moderation Effect of Problem Recognition for Change in Binge Drinking
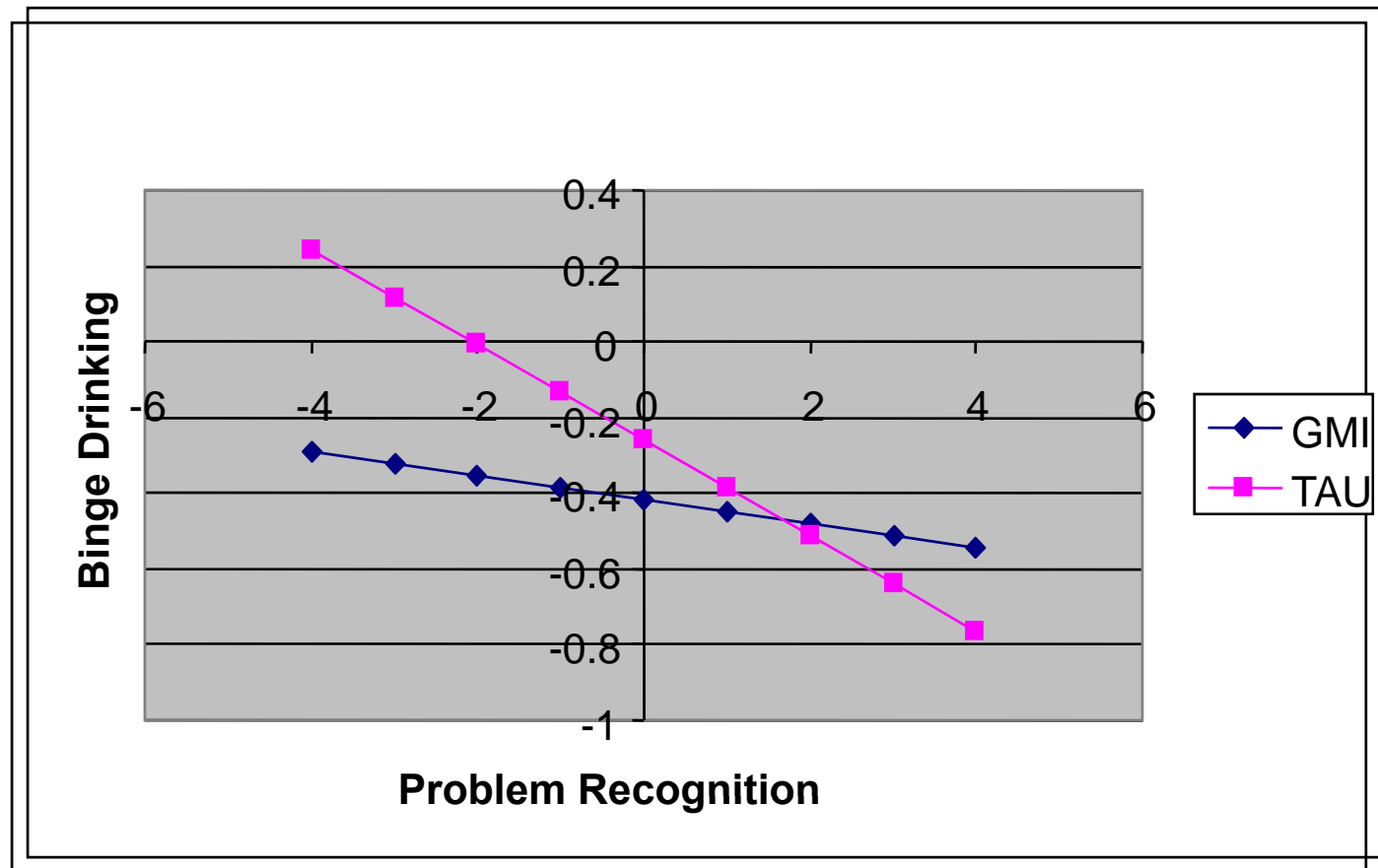
Summary

- All three interventions showed decreases in alcohol use at 3-month follow-up.

- Only IMI produced significant decreases in binge drinking days and maximum drinks when compared to TAU

- Higher levels of problem recognition led to lower levels of drinking at 3-month follow-up for GMI

Strengths/Limitations

- ➤ Strengths

  - Prospective

  - Randomized trial

  - Manualized intervention

- ➤ Limitations

  - Challenges with military sample

    - ✓ Deployment

    - ✓ PCS

    - ✓ Low follow-up rate

  - Differential session times

  - Self-selected sample

APPENDIX D:
PUBLICATIONS

Costs of Using Motivational Interviewing for Problem Drinking
in the U.S. Air Force

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ABSTRACT

Despite the popularity of motivational interviewing (MI) to address heavy drinking, limited evidence exists on the costs of using MI to address heavy drinking This study examines the costs of using MI to address heavy drinking at four U.S. Air Force (USAF) bases. Clients were referred to and assessed at a base program to address their drinking as a result of an incident; those who were not alcohol-dependent were invited to participate in the study. Participants were consented and randomly assigned to one of three intervention arms: individual MI (IMI), group MI (GMI), and Substance Abuse Awareness Seminar (SAAS). Three cost perspectives were taken: USAF, client, and the two combined. Data were collected from bases and public sources. The start-up cost per base varied from $1,340 to $2,400 per provider staff member. Average implementation costs across bases were highest for the SAAS ($148 per client) intervention.

INTRODUCTION

Background

A growing body of research examines brief interventions (BIs), which involve minimal interaction with a medical or mental health professional and focus on the health risks associated with drinking. BIs can be effective with young adult populations[1-4] and are particularly effective for individuals who do not have severe alcohol dependence but are drinking at harmful levels.[3,5] BIs have been ranked as one of the seven most cost-beneficial prevention services[6] and are effective in reducing alcohol use among most at-risk populations across a variety of settings.[1,7,8]

One of the most successful BIs used to date is motivational interviewing (MI).[5] MI is conceptualized as a style of therapeutic interaction that has at its core the belief that individuals are responsible for changing their behavior and for sustaining the changed behavior.[9] MI-based approaches have demonstrated effectiveness in young adult samples.[3,10] Thus, the military, which has a large proportion of young personnel, is a potentially fruitful population on which to conduct MI.

Approximately 45% of the 1.4 million active duty military in the United States[11] are under age 25.[12] These young adults experience many of the same issues and problems as young adults in the civilian population, including high rates of heavy alcohol use.[13] In 2005, approximately 10% of all active duty USAF personnel drank heavily in the past 30 days.[14] Aside from the obvious concerns of pilots engaging in problem drinking, recruits and young airmen have many technical duties that can be greatly compromised by the associated negative outcomes of alcohol use at work (e.g., Taylor et al.[15]).

One possible reason why MI has yet to be adopted widely in many settings—including the military—is that, despite its demonstrated effectiveness, limited information is available

about its cost. This study presents estimates for implementing MI in a military population. It makes three additional contributions to the broader literature. First, cost studies to date focus on brief advice given by a physician,[16-18] and none to our knowledge focus on a health care provider other than a physician or nurse delivering the intervention. Second, few studies adequately distinguish between start-up and implementation costs.[17-18] Third, the literature does not incorporate client costs. In the military, the time that clients spend attending an intervention while on duty represents a real resource cost.

The Air Force Motivational Interviewing Project

Cost estimates presented here are from a study to test two modes of delivering a brief MI for problem or risky drinkers at four USAF bases. Personnel were referred to an Alcohol and Drug Abuse Prevention and Treatment (ADAPT) program, typically by a superior officer, for a specific alcohol-related incident. At program intake, every USAF member was required to complete the Substance Use Assessment Tool (SUAT), a computer-based questionnaire that identifies problem or risky drinking by incorporating standard measures for substance use along with treatment planning, while also collecting other related data. The SUAT includes the Alcohol Use Disorders Identification Test (AUDIT), a validated instrument that captures risky drinkers and flags people with possible dependence for referral to full treatment.[19,20]

Participation in this study involved informed consent, which occurred at intake into the ADAPT program.[21] People flagged as possibly being dependent were screened out of the study using the AUDIT questions on the SUAT.

All eligible participants who gave consent were randomly assigned to one of three study conditions. The first was individual MI (IMI), a standard MI between one therapist and one client comprising one session intended to last approximately 45 minutes to 1 hour.[21] The

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therapist uses an empathic style to help the client identify discrepancies between goals and drinking, elicits self-motivational statements from the client, and discusses alternatives to help change drinking behavior.[22] The second was group MI (GMI).[23] By adapting MI to the complex therapeutic environment of a group of three to five clients, GMI represents a substantive innovation. It comprised one session, intended to last up to 3 hours. Training in MI was provided by the study principal investigator, who had herself been trained as an MI trainer, and used a manualized intervention, detailed elsewhere.[24]

The third study condition was treatment as usual, a 6- to 8-hour Substance Abuse Awareness Seminar (SAAS) held during 1 day for large groups of clients (~11) that was led by one or more ADAPT staff members. The seminar was designed to be educational and had limited opportunities for interaction between staff leading the seminar and the clients. The seminar was intended to incorporate information on individual responsibility, goal setting, and decision making; USAF standards; the legal, administrative, personal, and social consequences of substance abuse; the dynamics of substance abuse; models of addiction; and family dynamics.

The four bases are labeled A, B, C, and D. Bases A, C, and D are in different geographic areas of the United States; and Base B is located outside the continental United States. As described elsewhere, the client sample was fairly homogeneous.[21] The sample was predominantly male (81%), single (62%), young (mean age is about 27 years), educated at a high school level (85%), and enlisted rather than officer (96%).

MATERIALS AND METHODS

This study takes the perspective of those agents primarily affected by conducting each intervention: the staff members and clients who are paid for by USAF. USAF is the budgetary decision maker that employs the staff and funds the interventions. The majority of clients attend

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sessions while on duty, and session attendance displaces duties, thus also incurring a cost to USAF.

We developed cost data collection instruments to separate the costs into three mutually exclusive categories: research, start-up, and implementation. We also tracked research costs so they could be excluded from the estimates. Start-up activities were required to initiate MI and occurred before any interventions took place. Ongoing implementation activities maintained the interventions once start-up had occurred and included preparing for, delivering, and following up each session of the interventions. Because all clients received the same assessment and the assessment occurred before enrollment into the study condition, we omitted pre-intake assessment costs from the cost estimates. All estimates are presented in 2008 dollars.

Cost Data Collection

Data collection was staggered across the bases between January 2006 and August 2007; it began soon after bases were recruited for the study and continued until a base either prematurely stopped enrolling clients or completed the planned course of data collection. Approval was obtained by the research organization's institutional review board and two military human subjects protection review boards. Data collection was additionally arranged with base permission and facilitated by a senior ADAPT program manager who served as the study liaison at the base.

For training data, study records contained the value of the trainer's time, the time that the trainer spent traveling for and delivering the training, and staff attendance at each session. Intervention staff kept an anonymous log of time spent training by pay grade. Publicly available sources provided information on basic pay for each staff member and a set of allowances,

including basic subsistence, clothing, and housing.[25,26] We obtained the value of the space used for training from correspondence with the appropriate authorities at each base.

To gather data on the time staff spent implementing and supporting the interventions, the study liaison at each base completed cost instruments quarterly. For the SAAS condition, staff completed supplemental logs, which recorded start and end times for each session. Study liaisons also recorded the size and location of the room used for each intervention as well as information on annual pay at two bases and pay grade at the other two. Data on the value of space and came from the same sources as start-up costs.

To estimate client costs, a separate client survey describing alcohol use among study participants obtained information on the pay grade of participants at each base. Information on the pay and allowances of each pay grade came from public sources.[25] Additional information to estimate each client's travel costs, comprising the opportunity cost of time plus the use of a private vehicle to attend the session, came from public information on the location of on-base housing, the ADAPT offices, and the nearest town to the base. The proportion of clients on duty when attending a session (75%) was assumed based on personal correspondence with a USAF liaison. Because this was an important assumption, we varied its value to assess the impact on conclusions.

Estimating Start-up Costs

Start-up costs comprise the cost of training staff at bases to conduct MI: the cost associated with the trainer (the study principal investigator), the opportunity cost of the time that staff spent attending training, and the value of the space in which training occurred. We did not calculate start-up costs for SAAS. The manualized MI training synthesized MI delivery in

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individual and group settings to such a degree that IMI and GMI start-up costs were combined instead of being separately estimated.

The cost of the trainer includes the time spent training staff, travel time, and travel expenses, which were all available in study records. The time cost is the time spent multiplied by the hourly billing wage. The opportunity cost of the staff attending training is the hours spent in training activities multiplied by the wage rate and allowances. The wage rate was the monthly base pay plus allowances divided by 167 hours (the average hours worked per month). Data on allowances were matched by the midpoint of the pay grade band.[25] Although the hours spent in training varied across bases and across staff within bases, the bulk of time was spent in face-to-face training. For space costs, we assumed that each staff member used 15 square feet to train.[18] To that rate, we applied the estimated value of the space per hour.

Estimating Implementation Costs

From the USAF perspective, implementation costs have two components: (1) those directly associated with staff delivering the interventions, referred to as provider costs; and (2) a portion (assumed to be 75%) of the time clients spent traveling to and attending sessions. From the client perspective, the costs are the remaining portion (25%) of the time spent traveling to and attending sessions plus travel expenses.

Provider Costs

Provider costs are assumed to be completely incurred by USAF and comprise the value of staff time plus the value of the space used to conduct the intervention. Staff time is the time spent preparing for, conducting, and following up after the intervention.

For the interventions, we estimated the cost of the staff time by multiplying the time by the wage (monthly pay plus prorated allowances, divided by 167) of the staff conducting the

IMI. To obtain the cost per client for GMI, we then divided that cost by the average number of group participants in the quarter for each staff member. To estimate the cost of SAAS, we calculated the average wage for a session by taking a weighted average of wages (loaded with prorated allowances) based on how many hours each staff member worked. This loaded wage was then multiplied by the number of hours spent on SAAS to get the total labor cost. We then divided this number by the number of participants to obtain the labor cost per client. Space costs were added to all implementation costs by combining estimates of the size of the room where the intervention took place, the room location, the length of the session, and the per square foot per hour cost of the space.

Client Costs

We included the opportunity cost of travel time for those clients assumed to be attending a session on their own time. We assumed that these clients would be traveling from housing on base or the nearest town to the base. We estimated the travel distance from the nearest town to the on-base ADAPT offices and converted it to travel time using an Internet application (www.maps.google.com). For on-base housing or work, we assumed a distance of 1 mile, or 5 minutes of driving. We then multiplied the two estimates of travel time by the prorated wage and allowance. For the opportunity cost of travel time at each base within each intervention arm, we took the average of the two estimates. Travel expenses were for a personal car, which was estimated using the 2008 federal reimbursement rate of $0.505 per mile.[27]

RESULTS

Table 1 presents the start-up costs (travel and trainer expense and cost of trainee staff time) of both MI interventions (IMI and GMI) at each base. The total start-up cost per base ranged from $8,489 (Base D) to $16,054 (Base C). The greatest share of that cost was the

opportunity cost of the time that staff spent training, which ranged from 50% (Base D) to 72%
(Base C). This variation is determined largely by the number of staff being trained and by their
pay grade. Because the trainers used the same manual for their training, trainer costs varied little
between bases.

(Table 1 about here.)

Table 2 reports the average implementation cost of each intervention from the USAF
perspective, the client perspective, and the two perspectives combined. From all three
perspectives, SAAS cost the most per client and cost between 1.5 and 2 times the next most
expensive intervention. From two perspectives—USAF and USAF and client combined—IMI
was the next most expensive intervention, primarily because each intervention session only has
one client. The variation for IMI across bases was particularly large (base-level costs not shown
in table); for example, the cost per client at Base D ($55) was about half the cost at Base C
($112). The cost per client for GMI ranged from $53 (Base B) to $75 (Base C), and the cost for
SAAS ranged from $120 (Base D) to $180 (Base B).

(Table 2 about here.)

Table 3 presents detailed implementation cost estimates from the USAF perspective. The
provider costs represent the cost component that USAF can most directly influence by making
provider staffing and resource changes. Because space cost is a very small component of the cost
per client, this discussion focuses on the labor cost of providing services.

(Table 3 about here.)

Differences in labor costs across study conditions largely reflect differences in the
average loaded wage of the staff and the time taken to provide and support the session. The
average loaded wage was highest for GMI, followed by IMI and SAAS. In base-specific analyses

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not shown in the table, this ranking in average wage across study conditions was driven by two bases (A and D). At these two bases, staff delivering the MI conditions had a higher pay grade or more experience. The estimated length of intervention time was approximately as the study protocols intended, with SAAS taking the longest, followed by GMI and then IMI. Additional analyses indicated that this ranking of the average length of time per study condition held at each of the four bases.

An additional source of variation in cost for GMI and SAAS is the number of clients per session. The protocol for GMI limited the variation with a minimum of 3 and a maximum of 5 clients per session. Additional analyses indicated that the variation in SAAS was greater, with the average number of clients ranging from just over 8 (Base D) to nearly 14 (Base B). The number of clients per session in SAAS may reflect differences across bases in ADAPT program policies and resources; drinking opportunities, local prices, alcohol policies, and the enforcement of those policies; and the culture and demographics of the target population.

The relative share of providers and clients in USAF costs also varied by intervention, and these differences reflected both the length of time of the intervention and the number of clients per session. The share taken up by provider costs was highest for IMI (72%) and lowest for SAAS (20%). Client time cost to USAF was driven by the time clients spent attending rather than traveling to the session. Travel time costs were minimal—across bases and interventions, they rarely constituted more than 20% of the client time cost.

Table 4 shows the cost estimates from the 25% of clients assumed not to be on duty while traveling to and attending sessions (recall Table 3 included the other 75%, assumed to be on duty). These costs were from the client perspective and were thus not borne by USAF. The average loaded wage at each base, regardless of intervention arm, was low because the pay grade

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of most staff referred to an ADAPT program was low. However, pay grade varied somewhat across groups. Average loaded wage of the client (basic + various allowances) ranged from $16.28 (IMI) to $17.99 (GMI). For IMI and GMI, the cost from the client perspective of attending a session was about the same as the travel costs. The increased time spent in SAAS means that the attendance cost is necessarily much higher than in either MI arm, and thus so is the cost to the client.

(Table 4 about here.)

We conducted a sensitivity analysis to examine the degree to which conclusions changed when we varied the the key assumption that 75% of clients attend interventions while on duty. The analysis varied this proportion between 65% and 85% across intervention arms and across bases. We paid particular attention to the degree to which findings on the ranking of the intervention conditions by cost changed. In cost-effectiveness analysis—which assesses how costs of the interventions compare to their relative impact on outcomes—a key step is to rank order intervention by costs and/or effectiveness. Thus, changing the rank order of interventions would influence the conclusions drawn in future cost-effectiveness analyses. Under all of the scenarios examined, SAAS continued to be the most expensive intervention, both from the USAF perspective and from the client perspective. The results also indicated that the relative ranking of the costs of IMI and GMI varied under several scenarios.

DISCUSSION

This article presents estimates of the costs of starting up and implementing MI for problem drinking in an Air Force setting. The study makes three additional broader contributions to the literature. First, by presenting costs for a provider that is not a physician, the current estimates help expand the MI cost literature to settings that present opportunities to intervene in

problem drinking. Second, separately estimating start-up costs from implementation costs is important because, in addition to the magnitude of costs, decision makers need to understand the structure and timing of costs. Like most other settings in society, the military has relatively scarce treatment resources and must prioritize and plan appropriately. Budgets can be adjusted accordingly for starting a new program, such as an MI intervention. For example, a rough estimate of the cost of training three new staff members in MI at Base C was $8,787. This estimate was obtained by adding the fixed component of the cost—which is the trainer, travel, and space at $4,704 ($899 + $3,446 + $359)—to the variable component, which is the time of the staff at $4,083 (3 x $1,361 per staff member). Third, the study recognizes that the military underwrites the resources used by staff and clients when addressing problem drinking. Client costs are critical because they may represent barriers to treatment in some settings (depending on USAF and base policy), and in some settings—such as at some military bases—they are a real cost to the employer. Employers should understand what resources must be foregone by requiring personnel to attend treatment rather than perform regular duties.

Decision makers should note the impact on the cost of training and using personnel of varying pay grades. Almost all of the differences in start-up costs across bases came from the additional cost of staff training time or the opportunity cost of the salaried staff being trained. For example, the highest start-up cost (at more than $16,000) was almost twice that of the lowest (at nearly $9,000). Because training took a similar length of time across all sites, this variation was driven by the pay grade and the number of staff being trained. If ADAPT programs are operating at capacity, those in command of resources may not be able to affect either of these factors in the short term. But decisions about which staff are trained and which are not can certainly be made in the longer term. Pay grade also affects implementation costs. For example,

the staff cost per session—which is borne solely by USAF—of implementing GMI at three bases was between $23 and $29. At the fourth base, the session cost was only $9, primarily because the intervention was delivered by staff of a lower pay grade. Decision makers will need to balance these cost considerations against the benefits of using more qualified, experienced staff to deliver the interventions.

In future work, the estimates presented here on the per-client costs of the interventions should be combined with outcome measures (e.g., reductions in days drinking heavily) as part of a formal cost-effectiveness analysis. At that point, the rank ordering of interventions by cost will be critical. An early step in cost-effectiveness analysis is to eliminate dominated interventions, by rank ordering the interventions either by cost or by effectiveness.[28, 29] Any intervention that is both more expensive and less or equally effective is removed from further consideration. Because including client costs affects the rank ordering of interventions, it greatly affects any further analyses.

The study has two major limitations. First, data on staff time were reported quarterly by base liaisons and thus were subject to recording and recall error, despite the use of real-time logs at bases. Second, the estimates exclude ad hoc booster training sessions that may have occurred and any extra training that occurred as new staff joined ADAPT programs. Thus, the start-up costs may not be one-time costs and may be underestimated.

Applying the study results to current practice in the military requires two additional considerations. First, late in the study, USAF replaced the educational SAAS with an intervention that was designed to contain MI. This change did not appreciably affect the bases in this study because the bases did not use the new curriculum during the period of enrolling subjects and providing interventions. Second, ADAPT resource control systems do not

necessarily use dollars as a basis of measure. They instead code day-to-day activities using

resource value units. However, the four bases in this study varied showed inconsistencies in the

use of these codes. Thus, results in this study are reported using dollars, which are the ultimate,

fungible metric.

ACKNOWLEDGMENTS

REFERENCES

1. Bien TH, Miller WR, Tonigan JS: Brief interventions for alcohol problems: a review. Addiction 1993;88(3):315-35.

2. Brown JM, Miller WR: Impact of motivational interviewing on participation and outcome in residential alcoholism treatment. Psychol Addict Behav 2993;7:211-8.

3. Marlatt GA, Baer JS, Kivlahan DR, Dimeff LA, Larimer ME, Quigley LA, et al.: Screening and brief intervention for high-risk college student drinkers: results from a 2-year follow-up assessment. J Consult Clin Psychol 1998;66(4):604-15.

4. Miller WR: Rediscovering fire: small interventions, large effects. Psychol Addict Behav 2000;14(1):6-18.

5. Butler C, Rollnick S, Cohen D, Russell I, Bachmann M, Stott N: Motivational consulting versus brief advice for smokers in general practice: a randomized trial. Br J Gen Pract 1999;49:611-6.

6. Coffield AB, Maciosek MV, McGinnis JM, Harris JR, Caldwell MB, Teutsch SM, et al.: Priorities among recommended clinical preventive services. Am J Prev Med 2001;21(1):1-9.

7. Moyer A, Finney JW, Swearingen CE, Vergun P. Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. Addiction 2001;97(3):279-92.

8. Wilk AI, Jensen NM, Havighurst TC. Meta-analysis of randomized control trials addressing brief interventions in heavy alcohol drinkers. J Gen Intern Med 1997;12(5):274-83.

9.   Miller WR, Rollnick S: Motivational Interviewing: Preparing People for Change. New York, Guilford, 2002.

10.   Monti PM, Colby SM, Barnett NP, Spirito A, Rohsenow DJ, Myers M, et al.: Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. J Consult Clin Psychol 1999;67(6):989-94.

11.   Department of Defense: Armed Forces Strength Figures for November 30, 2008. Retrieved January 7, 2009, from http://siadapp.dmdc.osd.mil/personnel/MILITARY/ms0.pdf.

12.   U.S. Government Accountability Office: Military Personnel: Active Duty Benefits Reflect Changing Demographics, But Continued Focus Is Needed. Washington, DC, U.S. Government Accountability Office, 2002.

13.   Substance Abuse and Mental Health Services Administration: Summary of Findings from the 2000 National Household Survey on Drug Abuse. NHSDA Series H-13 (DHHS Publication No. [SMA] 01-3549). Rockville, MD, Office of Applied Studies, 2001.

14.   Bray RM, Hourani LL: Substance use trends among active duty military personnel: findings from the United States Department of Defense Health Related Behavior Surveys, 1980–2005. Addiction, 2007;102:1092-1101.

15.   Taylor JE, Haddock CK, Poston C, Talcott WG: Relationship between patterns of alcohol use and negative alcohol-related outcomes among U.S. Air Force recruits. Mil Med 2007;172(4):379-82.

16.   Fleming MF, Mundt MP, French MT, Manwell LB, Stauffacher EA, Barry KL: Benefit-cost analysis of brief physician advice with problem drinkers in primary care settings. Med Care 2000;38(1):7-18.

17. Wutzke SE, Shiell A, Gomel MK, Conigrave KM: Cost effectiveness of brief interventions for reducing alcohol consumption. Soc Sci Med 2001; 52(6):863-70.

18. Zarkin GA, Bray JW, Davis KL, Babor TF, Higgins-Biddle JC: The costs of screening and brief intervention for risky alcohol use. J Stud Alcohol Drugs 2003;64(6):849-57.

19. Allen JP, Litten RZ, Fertig JB, Babor T: A review of research on the Alcohol Use Disorders Identification Test (AUDIT). Alcohol Clin Exp Res 1997;21(4):613-9.

20. Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG: AUDIT: The Alcohol User Disorders Identification Test—Guidelines for Use in Primary Care. Geneva, Switzerland, World Health Organization, 2001.

21. Brown JM: Motivational interventions to reduce alcohol use in a military population. Presented at the Research Society on Alcoholism Annual Meeting, Washington, DC, June 2008.

22. Miller JH, Moyers T: Motivational interviewing in substance abuse: applications for occupational medicine. Occup Med 2002;17(1):51-65.

23. Rae Olmsted KL, Hunter C, Brown JM: Motivational interventions to reduce alcohol use in a military population. Presented at Military Health Research Forum, San Juan, Puerto Rico, May 2006.

24. Department of Defense: 2008 Military Pay Tables. Retrieved January 7, 2009, from http://www.dfas.mil/militarypay/militarypaytables/2008MilitaryPayCharts35.pdf.

24. Miller WR, Yahne CE, Moyers TB, Martinez J, Pirritano M: A randomized trial of methods to help clinicians learn motivational interviewing. J Consult Clin Psychol 2004;72(6):1050-62.

25. Department of Defense: Interactive Demographic Analysis System (IDEAS). Retrieved January 29, 2009, from http://w11.afpc.randolph.af.mil/vbin/broker8.exe?_program=ideas.IDEAS_default.sas&_ service=prod2pool3&_debug=0, 2009c.

26. Internal Revenue Service: IRS Announces 2008 Standard Mileage Rates; Rate for Business Miles Set at 50.5 Cents per Mile. Retrieved January 7, 2009, from http://www.irs.gov/newsroom/article/0,,id=176030,00.html.

27. Drummond MF, Sculpher MJ, Torrance GW, O'Brien BJ, Stoddart GL: Methods for the Economic Evaluation of Health Care Programmes. Oxford: Oxford University Press, 2005.

28. Bala MV, Zarkin GA: Application of cost-effectiveness analysis to multiple products: a practical guide. Am J Manag Care, 2002;8(3):211-8.

TABLE 1. Start-up Costs for Motivational Interviewing (IMI + GMI) by Base ($2008)

Resource and Cost	Base A	Base B	Base C	Base D
Travel	$919	$2,506	$899	$768
Trainer time	$3,446	$4,307	$3,446	$3,446
Space cost	$29	$10	$76	$36
Trainer time + space cost (fixed cost) subtotal	$4,394	$6,823	$4,421	$4,249
Staff training time (variable cost)	$5,192	$7,313	$11,633	$4,239
Total cost at base	$9,586	$14,137	$16,054	$8,489
Number of provider staff trained	4	8	12	5
Fixed cost per staff member	$1,098	$853	$368	$850
Variable cost per staff member	$1,298	$914	$969	$848
Total cost per provider staff member trained at base	$2,396	$1,767	$1,338	$1,698

TABLE 2. Implementation Costs by Study Condition ($2008)

Resource and Cost	IMI	% Share	GMI	% Share	SAAS	% Share
	Average across Bases					
Number of study participants	115		143		844	
Intervention cost per client from USAF perspective[a]	$73	86%	$54	77%	$113	76%
Intervention cost per client from client perspective[b]	$12	14%	$16	22%	$35	24%
Intervention cost per client: USAF and client perspectives combined	$84	100%	$70	100%	$148	100%

Note: IMI = individual motivational interviewing, GMI = group motivational interviewing, SAAS = Substance Abuse Awareness Seminar (treatment as usual), USAF = U.S. Air Force

[a] The USAF perspective includes 75% of client opportunity cost, which comprises time spent attending and time spent traveling for a session.

[b] The client perspective includes 25% of client opportunity cost and all client travel expenses. The client opportunity cost comprises time spent attending and time spent traveling for a session.

TABLE 3. Detailed Average Costs by Study Condition: USAF Perspective ($2008)

Resource and Cost	IMI	GMI	SAAS
Number of people exposed to the intervention condition	115	143	844
Average staff wage			
Basic	$21.42	$25.13	$18.97
Allowance	$6.36	$6.76	$5.97
Loaded (basic + allowance)	$27.78	$31.89	$24.94
Average intervention length (hrs)			
Length of session[a]	1.34	1.99	6.99
Time delivering session	1.34	1.99	7.52
Time supporting session	0.52	0.89	1.70
Space cost			
Room size	182	396	376
Cost per hour per 100 sq ft	$0.12	$0.13	$0.14
Cost per session[b]	$52.52	$92.43	$229.72
Participants per session	1.00	4.37	11.25
Provider cost per client to USAF[c]	$52.52	$23.64	$22.17
Proportion of cost	72%	44%	20%
Client travel time cost[d]	$3.49	$4.30	$3.49
Client session time cost[e]	$16.58	$26.30	$87.24
Client time cost to USAF	$20.07	$30.60	$90.74
Proportion of cost within intervention and base	28%	56%	80%
Intervention cost per client from USAF perspective (see Table 2)[f]	$72.60	$54.24	$112.91
	100%	100%	100%

Note: IMI = individual motivational interviewing, GMI = group motivational interviewing, SAAS = Substance

Abuse Awareness Seminar (treatment as usual), USAF = U.S. Air Force

[a] For IMI and GMI, the length of a session is determined by staff reports. For SAAS, the length of a session is

determined by staff reports and the syllabus, depending on whether multiple staff help deliver the session.

[b] Includes the cost of time delivering the session, time supporting the session, and space cost.

[c] Because averages of averages are presented, the provider cost per client may not be calculated by dividing the

session cost by participants per session.

[d] Includes 75% of the client travel time cost.

[e] Includes 75% of the client session time cost.

[f] Equals provider cost per client plus client time cost.

TABLE 4. Detailed Average Costs by Study Condition: Client Perspective ($2008)

Resources and Cost	IMI	GMI	SAAS
Number of study participants	115	143	844
Average client wage			
Basic	$9.35	$12.68	$11.49
Allowance	$6.93	$5.31	$5.12
Loaded (basic + allowance)	$16.28	$17.99	$16.61
Client cost of attending session			
Length of a session (hours)[a]	1.34	1.99	6.99
Session cost[b]	$5.53	$8.77	$29.08
Client cost of traveling to session			
Travel time cost[c]	$1.16	$1.43	$1.16
Transportation cost	$4.99	$5.42	$5.09
Intervention cost per client from client perspective (see Table 2)[d]	$11.68	$15.62	$35.34

Note: IMI = individual motivational interviewing, GMI = group motivational interviewing, SAAS = Substance

Abuse Awareness Seminar (treatment as usual), USAF = U.S. Air Force

[a] For IMI and GMI, the length of a session is determined by staff reports. For SAAS, the length of a session is

determined by staff reports and the syllabus, depending on whether multiple staff help deliver the session.

[b] Includes 25% of the client travel time cost.

[c] Includes 25% of the client session cost.

[d] Equals session cost + travel time cost + transportation cost.

Heavy Episodic Drinking and Associated Problems among Military Personnel

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Abstract

Purpose. The purpose of the present study was to examine heavy episodic drinking frequency, risk-taking, and impulsiveness among military personnel. *Methods.* Air Force personnel (N = 313) from four military installations self-reported alcohol use and alcohol-related consequences at baseline and at a 3-month follow-up. Classifications of frequent heavy episodic drinkers, infrequent heavy episodic drinkers, and non-heavy episodic drinkers were made based on the number of heavy episodic drinking episodes reported during the past month. Analysis of variance and chi-square tests were utilized to compare groups. A multiple regression analysis was conducted to explain the variance in heavy episodic drinking related to alcohol consumption at follow-up. *Results.* Comparisons were made among frequent heavy episodic drinkers (2 or more heavy drinking episodes during the previous 30 days), infrequent heavy episodic drinkers (1 heavy drinking episode), non-heavy episodic drinkers (no episodes of heavy drinking), and non-drinkers (no alcohol consumption in the past 30 days). Frequent heavy episodic drinkers consumed alcohol on average when they drank and drank on more days overall, were more likely to drink and drive, and had more alcohol-related consequences than all other groups. *Implications.* The present data indicate that even within a population of heavy episodic drinkers, there is important variability associated with alcohol use. Heavy episodic drinking rates have essentially remained unchanged in military populations over the past decade and policy makers need to commit to a long-term strategy for effecting behavior change that includes addressing expectancies, norms perceptions, and when possible, conduct an individual risk assessment.

Introduction

Alcohol abuse is a recognized problem among military personnel. Although there were some reductions in heavy episodic drinking (defined as 5 or more drinks at one time or 4 or more for women during the past 30 days) among active duty personnel from 1980 (21%) to 1988 (17%), there were no significant changes from 1988 (17%) to 1998 (15%). Of note, however, was the increase in heavy use from 1998 (15%) to 2005 (19%) reported in the 2005 DoD Survey of Health Related Behaviors conducted by RTI (Bray et al., 2006; Bray & Hourani, 2007). Heavy episodic drinkers are of concern because they experienced greater productivity loss, and a larger number of serious consequences, more alcohol dependence symptoms; they are also more likely to report suicidal ideation as well as symptoms of depression and anxiety (Bray et al., 2006; Bray et al., 2003; Bray & Hourani, 2007). Problem drinking can result in high-risk sex, occupational injury, drunk driving, domestic violence, and other negative social and/or health outcomes. Further, alcohol misuse is implicated in readiness issues for military personnel, such as the increased risk for incidence of stress fractures (Lappe et al., 2001), other injury risk (Henderson et al., 2000), work productivity loss (Fisher et al., 2000), and motor vehicle injury (Bell et al., 2000). Heavy episodic drinking is also routinely found in other young adult populations. In a national surveys of college drinking, at least 40% of students acknowledged heavy episodic drinking at least once within the previous two weeks (Bennett et al., 1999; Johnston et al., 1996; O'Malley & Johnston, 2002; Presley et al., 1995; Wechsler et al., 1994; Wechsler et al., 2002; Weitzman et al., 2003).

Understanding the factors that contribute to the high rates of heavy episodic drinking on military installations requires the examination of a number of contributing factors. Clearly, the

environment of the installation provides opportunities for heavy drinking for young people who are away from home and parental controls for the first time. Without the external control provided by family rules, the temptation to engage in risky behavior may increase. One issue that is important for understanding the impact of heavy episodic drinking in military populations is whether the frequency of heavy episodic drinking has a differential effect on engaging in high-risk behaviors. Existing research has established a connection between heavy episodic drinking and risk-taking, and one can postulate that the likelihood of engaging in risky behaviors varies across heavy episodic drinking levels, both as a function of increased episodes of drinking and also because higher levels of alcohol use contribute to poor decision-making and judgment. Previous studies have examined populations of individuals who acknowledge heavy episodic drinking, but there have been few studies that have considered heavy episodic drinking frequency per se in a military sample. The purpose of the present study was to examine heavy episodic drinking frequency and its relation to risk-taking among a sample of military personnel.

<div align="center">Method</div>

<ins>Participants</ins>

Participants were personnel who were referred to the local Alcohol and Drug Abuse Prevention program at their installation as the result of an alcohol infraction (N=313). The study was approved by local and military Institutional Review Boards and all participants provided written consent prior to data collection.

<ins>Measures</ins>

<ins>Demographics</ins>. A demographics form was used to collect information concerning age, race, gender, and rank.

Alcohol consumption. A quantity-frequency (QF) instrument based on work by Cahalan and Cisin (1968) was used to determine self-reported alcohol use. Participants responded to questions concerning their alcohol use during the past 30 days. The QF yields information concerning the frequency of drinking and both modal and maximum quantities consumed over the preceding 30-day interval. Summary measures were computed for (1) the total number of drinking days, (2) the average number of drinks consumed on drinking days, and (3) the total number of days on which five or more drinks (4 for women) were consumed.

Alcohol-related consequences. The Young Adult Alcohol Problem Screening Test (YAAPST-36; Hurlburt & Sher, 1992) was developed specifically for use with young adults and will be used to assess negative consequences of drinking. This 36-item questionnaire asks respondents to record the number of times during the previous 3 months that they have experienced such events as getting into physical fights, getting into sexual situations they later regretted, driving while intoxicated, experiencing blackouts, and so on. The test-retest reliability correlation over approximately 9 months was reported at .73 when individuals were asked about consequences experienced over the past year.

Data analysis

Classifications of frequent heavy episodic drinkers, infrequent heavy episodic drinkers, and non-heavy episodic drinkers were based on the number of heavy episodic drinking episodes reported during the past month. Frequent heavy episodic drinkers had two or more heavy episodic episodes in the past 30 days; infrequent heavy episodic drinkers reported one episode of heavy episodic drinking during the past month, and non-heavy episodic drinkers were drinkers who reported no heavy episodes during the past 30 days but did acknowledge using alcohol

during that same time period. Non-drinkers reported no alcohol use during the past 30 days.

Analysis of variance and chi-square tests were utilized to compare groups. A multiple regression

analysis was conducted to predict alcohol consumption and alcohol-related consequences at

follow-up from baseline heavy episodic drinking.

<div align="center">Results</div>

Sample characteristics

   Male participants made up 84% of the sample. Eighty percent of participants were

Caucasian, with the balance being comprised of African-American (13%), Asian (3%), and other

or unspecified (4%) individuals. Of the 313 participants, 93% reported consuming alcohol at

least once during the past 30 days. Overall, the mean age of participants was 24.7. Cigarette

smoking was reported by 44% of the full sample. Forty-one percent of the participants reported a

family history of alcohol problems. Seven percent ($\underline{n} = 21$) of the sample reported no alcohol

consumption during the past month. Of the full sample, 10% ($\underline{n} = 33$) were classified as frequent

heavy episodic drinkers, 41% ($\underline{n} = 127$) as infrequent heavy episodic drinkers, and 42% ($\underline{n} =$

130) as non-heavy episodic drinkers. There were no significant differences in age, education,

gender, or cigarette smoking status among the groups (see Table 1).

Alcohol use

For the full sample of drinkers, the average number of reported drinking days was 2.1 days out of

the past 30. The typical amount consumed during a drinking occasion was 4.5 drinks. The

participants reported 3.7 days of heavy episodic drinking.

Alcohol-related consequences

   Significant differences were also found on the total number of alcohol-related

consequences experienced, $\underline{F}$ (3, 307) = 21.56, $\underline{p}$ <.0005. Frequent heavy episodic drinkers

experienced the largest number of consequences, followed by infrequent heavy episodic drinkers

and non-heavy episodic drinkers. As well, a larger percentage of both frequent and infrequent

heavy episodic drinkers compared to non-heavy episodic drinkers endorsed drinking and driving,

χ^2 (2) = 26.29, $\underline{p}$ < .001, and had experienced blackouts, χ^2 (2) = 28.43, $\underline{p}$ < .001.

<u>Frequency of heavy episodic drinking comparisons</u>

Among drinkers, significant group differences were found on the total number of

drinking days during the previous month, $\underline{F}$(2, 196) = 58.23, $\underline{p}$ < .001, average number of drinks

per drinking day, $\underline{F}$(2, 196) = 54.65, $\underline{p}$ < .001, and self-reported frequency of intoxication, $\underline{F}$ (2,

196) = 49.13, $\underline{p}$ < .001. Follow-up univariate tests indicated that the three heavy episodic groups

differed significantly on the number of days drinking and the average number of drinks per

occasion, with frequent heavy episodic drinkers reporting the highest levels of alcohol use,

followed by infrequent heavy episodic drinkers and non-heavy episodic drinkers, respectively.

Comparisons between frequent and infrequent heavy episodic drinkers yielded significant

differences on the total number of days drinking, $\underline{t}$ (131) = 6.20, $\underline{p}$ < .001, average number of

drinks per drinking day, $\underline{t}$ (129) = 4.05, $\underline{p}$ < .001, and total number of heavy episodic drinking

episodes during the past 30 days, $\underline{t}$ (131) = 14.39, $\underline{p}$ < .001.

Frequent heavy episodic drinkers were not more likely to be current cigarette smokers

than any of the other groups. This is likely due to the high rate of tobacco use among military

personnel.

<u>Multiple regression analysis</u>

A standard multiple regression was performed between number of heavy episodic

drinking days as the dependent variable and total consequences score and AUDIT score as the

independent variables (IVs). $\underline{R}$ for regression was significantly different from zero, $\underline{F}$ (3, 297)

52.67, $\underline{p}$ < .001. Both of the IVs contributed significantly to the prediction of heavy episodic

drinking, consequences, $\underline{sr}^2$ = .248, and AUDIT, $\underline{sr}^2$ = .133. Altogether, 35% of the variability in

heavy episodic drinking was predicted by knowing scores on these two measures.

Discussion

The present study examined the frequency of heavy episodic drinking and risk-taking in a

population of military drinkers and found that an increased frequency of heavy episodic drinking

was strongly associated with a number of risky behaviors. When compared to low-frequency

heavy episodic drinkers and non-heavy episodic drinkers, high-frequency heavy episodic

drinkers were more likely to drink and drive and to engage in risky behaviors across a number of

domains, including sexual risks. While these data are troublesome, what is particularly relevant

is the increase in sexual risk-taking (having sex without a condom, having sex with someone that

is not well known to the individual) and driving under the influence of alcohol. These latter

behaviors are likely to have a direct effect on other military personnel, regardless of others'

drinking behaviors, and the findings are consistent with previous research in college populations

demonstrating that heavy episodic drinking in general places all students at risk (Shalala, 1995;

Wechsler et al., 1994, 2002; Wechsler et al., 1995).

As previously reported, the association between heavy episodic drinking and problem

behaviors is well documented (Kann et al., 1993; Marlatt et al., 1995; Wechsler et al., 1994).

However, the present data indicate that even within a population of heavy episodic drinkers,

there is important variability associated with risk-taking and that the strongest effect of engaging

in risk-taking was frequency of heavy episodic drinking. It was not simply losing control (i.e.,

heavy episodic drinking in general), but rather a consistent pattern (i.e., increased frequency) of

loss of control that demonstrated the strongest effect. The combination of an increased

propensity for risk-taking among heavy episodic drinkers and the drinking environment of

military installations, which supports heavy alcohol use, places personnel (both drinking and

non-drinking) at increased risk for experiencing negative consequences.

This research emphasizes the need to develop comprehensive strategies to reduce the

consequences to society of heavy episodic drinking among young adults. Military drinking does

not only affect military populations. Installation and community officials should both be

involved in the development of plans to reduce drinking and its consequences (Dowdall &

Wechsler, 2002). Most intervention efforts have focused within the military community, but

perhaps what is needed is a multilevel intervention in which community resources can also be

tapped to reduce availability and enforce drinking age laws. Local interventions that challenge

inaccurate alcohol expectancies and focus on developing skills needed to moderate drinking

behavior have shown success in young adults (Kivlahan et al., 1990; Marlatt et al., 1995, 1998).

 Similarly, from the community perspective, server intervention programs and sobriety

checkpoints have been shown to lead to reduced alcohol consumption (Russ & Geller, 1986).

In closing, this study is not without limitations. The data are based on surveys of self-

reported behaviors, and despite research indicating the validity of this approach in assessing

alcohol-related problems (Johnson & Mott, 2001; Midanik, 1988), the results may be biased.

This research did not include a measure of expectancies that may well have had a strong

influence on engaging in risk-taking and heavy episodic drinking (Turrisi, 1999).   Relatedly, the

social environment of military personnel is potentially a strong predictor of engaging in episodic heavy drinking and should be examined in future studies; research has shown that dormitory residence increases the odds of engaging in heavy episodic drinking (Larimer et al., 2001; Wechsler et al., 1995).

The relation among the frequency of drinking, heavy episodic drinking, and risk-taking is inherently confounded in that increased drinking likely leads to increased heavy episodic drinking, and thus more opportunity to engage in high-risk behaviors. Finally, having only a 3-month follow-up assessment in the study precludes making statements that concern the long-term consequences of heavy episodic drinking. However, the potential for deleterious effects of engaging in some of these behaviors, even once, is cause for concern.

The scope of the problem of alcohol use on military installations, by definition, indicates that short-term solutions will be ineffective. Heavy episodic drinking rates have essentially remained unchanged in military populations over the past decade (Wechsler et al., 2002) and the military needs to commit to a long-term strategy for effecting behavior change that includes addressing expectancies, norms perceptions, and when possible, individual risk. A public health approach that focuses on alternative activities may also weaken the link between alcohol use and high-risk behaviors.

Table 1. Demographic and Substance-Related Variables for Frequent, Infrequent, and Non

Heavy Episodic Drinkers and Non-Drinkers

	Frequent Heavy Episodic	Infrequent Heavy Episodic	Non Heavy Episodic	Non-Drinker
Age	25.0	25.4	23.8	25.6
Days Drinking	4.0	2.1	1.8	NA
Average Drinks	6.6	6.5	2.5	NA
Heavy Episodic Days	3.7	1	NA	NA
Drinks on Heaviest Drinking Day	10.5	8.2	2.8	NA
Alcohol-Related Consequences	4.8	2.8	1.4	NA
Family History of Alcohol Problems	55%	46%	37%	21%
Cigarette Use	58%	44%	42%	38%
Drove After Drinking	45%	15%	15%	13%
Productivity Loss	12%	14%	5%	5%

References

Babor, T.F., Stephens, R.S., Marlatt, G.A., 1987. Verbal report methods in clinical research on

alcoholism: Response bias and its minimization. J Stud Alcohol. 48, 412-424.

Bell, N.S., Amoroso, P.J., Yore, M.M., Smith, G.S., & Jones, B.H. (2000). Self-reported risk-

taking behaviors and hospitalization for motor vehicle injury among active duty Army

personnel. *American Journal of Preventive Medicine, 18*, Suppl. 85-95.

Bennett, M. E., Miller, J. H., Woodall, W.G., 1999. Drinking, binge drinking, and other drug use

among southwestern undergraduates: Three-year trends. Am J Drug Alcohol Abuse. 25,

331-350.

Bray, R. M., Hourani, L., Rae, K. L., Brown, J. M., Pemberton, M. R., Marsden, M. E., Faulkner,

D. L., & Vandermaas-Peeler, R. (2006). *2005 Department of Defense Survey of Health

Related Behaviors Among Military Personnel*. Prepared for the U.S. Department of

Defense. Research Triangle Park, NC: RTI International.

Bray, R.M., & Hourani, L.L. (2007). Substance use trends among active duty military personnel:

Findings from the United States Department of Defense Health Related Behavior

Surveys, 1980-2005. Addiction, 102(7): 1092-1101.

Carey, K.B., 1995. Heavy drinking contexts and indices of problem drinking among college

students. J Stud Alcohol. 56, 297-292.

Dowdall, G.W., Crawford, M., Wechsler, H., 1998. Binge drinking among American women: A

comparison of single-sex and coeducational institutions. Psychol Women Q. 22, 705-715.

Dowdall, G.W., Wechsler, H., 2002. Studying college alcohol use: Widening the lens,

sharpening the focus. J Stud Alcohol. Supplement No. 14, 14-22.

Eysenck, S.B.G., Eysenck, H.J., 1978. Impulsiveness and venturesomeness: their position in a

dimensional system of personality description. Psychol Rep. 43, 1247-1255.

Eysenck, S.B.G., Eysenck, H.J., Barrett, P., 1985. A revised version of the psychoticism scale.

Personality Individual Differences. 6, 21-29.

Fisher, C.A., Hoffman, K.J., Austin-Lane, J., & Kao, T.C. (2000). The relationship between

heavy alcohol use and work productivity loss in active duty military personnel: A

secondary analysis of the 1995 Department of Defense Worldwide Survey. *Military

Medicine*, *165*, 355-361.

Goldsmith, H.H., 1983. Genetic influences on personality from infancy to adulthood. Child

Dev. 54, 331-355.

Henderson, N.E., Knapik, J.J., Shaffer, S.W., McKenzie, T.H., & Schneider, G.M. (2000).

Injuries and injury risk factors among men and women in the U.S. Army Combat Medic

Advanced Individual Training. *Military Medicine*, *165*, 647-652.

Hingson, R., Berson, J., Dowley, K., 1997. Interventions to reduce college student drinking and

related health and social problems. In: Plant, M., Single, E., and Stockwelll, T. (Eds.),

Alcohol: Minimizing the Harm: What Works. Free Association Books Ltd., London, pp.

143-170.

Hurlbut, S.C., & Sher, K.J. (1992). Assessing alcohol problems in college students. *Journal of

American College Health, 41,* 49-58.

Johnson, T.P., Mott, J.A., 2001. The reliability of self-reported age of onset of tobacco, alcohol

and illicit drug use. Addiction. 96, 1187-1198.

Johnston, L.D., O=Malley, P.M., Bachman, J.G., 1995. National Survey Results on Drug Use

from the Monitoring the Future Study, 1975-1994. Volume 1: Secondary School
Students. NIH Pub No. 95-4206. Department of Health and Human Services, National
Institute on Drug Abuse, Rockville, MD.

Johnston, L.D., O=Malley, P.M., Bachman, J.G., 1996. National Survey Results on Drug Use
from the Monitoring the Future Study, 1975-1994: Volume II: College Students and
Young Adults. NIH Pub No. 95-4027. Department of Health and Human Services,
National Institute on Drug Abuse, Rockville, MD.

Kann, L., Warren, W., Collins, J.L., Ross, J., Collins, B., Kolbe, L.J., 1993. Results from the
National School-Based 1991 Youth Risk Behavior Survey and progress toward achieving
related health objectives for the nation. Pub Health Rep. 108, Supplement, 47-55.

Kivlahan, D.R., Marlatt, G.A., Fromme, K., Coppel, D.B., Williams, E., 1990. Secondary
prevention with college drinkers: Evaluation of an alcohol skills training program. J
Consult Clin Psychol. 58, 805-810.

Lappe, J.M., Stegman, M. R., & Recker, R.R. (2001). The impact of lifestyle factors on stress
fractures in female Army recruits. *Osteoporosis International*, *12*, 35-42.

Larimer, M.E., Turner, A.P., Anderson, B.K., Fader, J.S., Kilmer, J.R., Palmer, R.S., Cronce,
J.M., 2001. Evaluating a brief intervention with fraternities. J Stud Alcohol. 62, 370-380.

Leichliter, J.S., Meilman, P.W., Presely, C.A., Cashin, J.R., 1998. Alcohol use and related
consequences among students with varying levels of involvement in college athletics. J
Am Coll Health. 46, 257-262.

Marlatt, G.A., Baer, J.S., Kivlahan, D.R., Dimeff, L.A., Larimer, M., Quigley, L.A., Somers,
J.M., Williams, E., 1998. Screening and brief intervention for high-risk college student

drinkers: Results from a 2-year follow-up assessment. J Consult Clin Psychol. 66, 604-615.

Marlatt, G.A., Baer, J.S., Larimer, M., 1995. Preventing alcohol abuse in college students: A harm-reduction approach. In: Boyd, G.M., Howard, J., and Zucker, R.A. (Eds.), Alcohol Problems among Adolescents: Current Directions in Prevention Research. Lawrence Erlbaum Associates, Hillsdale, NJ, pp. 147-172.

Midanik, L., 1988. Validity of self-reported alcohol use: A literature review and assessment. Br J Addictions. 83, 1019-1030.

Miller, W.R., Tonigan, J.S., Longabaugh, R., 1995. The Drinker Inventory of Consequences (DrInC): An Instrument for Assessing Adverse Consequences of Alcohol Abuse. Test Manual. (Volume 4, Project MATCH Monograph Series). National Institute on Alcohol Abuse and Alcoholism, Rockville, MD.

Nagoshi, C.T., Wilson, J.R., Rodriguez, L.A., 1991. Impulsivity, sensation seeking, and behavioral and emotional responses to alcohol. Alcohol Clin Exp Res. 15, 661-667.

O'Malley, P.M., Johnston, L.D., 2002. Epidemiology of alcohol and other drug use among American college students. J Stud Alcohol. Supplement No. 14, 23-39.

Prendergast, M.L., 1994. Substance use and abuse among college students: A review of recent literature. College Health. 43, 99-113.

Presley, C.A., Meilman, P.W., Lyerla, R., 1995. Alcohol and Drugs on American College Campuses: Use, Consequences, and Perceptions of the Campus Environment. Vol. II: 1990-1992. Southern Illinois University at Carbondale, Carbondale, IL.

Russ, N.W., Geller, E.S., 1986. Using sobriety tests to increase awareness of alcohol

impairment. Health Educ Res. 1, 255-261.

Ryan, B., DeJong, W., 1998. Making the Link: Academics and Prevention. Department of

Education, Higher Education Center for Alcohol and Other Drug Prevention, Newton,

MA.

Shalala, D.E., 1995. College Students and Drinking. (Alcohol Alert No. 29, PH 357). National

Institute on Alcohol and Alcohol Abuse, Rockville, MD.

Tonigan, J.S., Miller, W.R., Brown, J.M., 1997. The reliability of Form 90: An instrument for

assessing alcohol treatment outcome. J Stud Alcohol. 58, 358-364.

Turrisi, R., 1999. Cognitive and attitudinal factors in the analysis of alternatives to binge

drinking. J Appl Soc Psychol. 29, 1512-1535.

Wechsler, H., Davenport, A., Dowdall, G.W., Moeykens, B., Castillo, S., 1994. Health and

behavioral consequences of binge drinking in college: A national survey of students at

140 campuses. J Am Med Assoc. 272, 1672-1677.

Wechsler, H., Dowdall, G.W., Davenport, A., & Rimm, E.B., 1995. A gender-specific measure

of binge drinking among college students. Am J Public Health. 85, 982-985.

Wechsler, H., Dowdall, G.W., Maenner, G., Gledhill-Hoyt, Lee, H., 1998. Changes in binge

drinking and related problems among American college students between 1993 and 1997.

 J Am Coll Health. 47, 57-68.

Wechsler, H., Lee, J., Kuo, M., Lee, H., 2000. College binge drinking in the 1990s: A continuing

problem. Results of the Harvard School of Public Health 1999 College Alcohol Study. J

Am Coll Health. 48, 199-210.

Wechsler, H., Lee, J.E., Nelson, T.F., Kuo, M., 2002. Underage college students= drinking

behavior, access to alcohol, and the influence of deterrence policies. J Am Coll Health.

50, 223-236.

Wechsler, H., Moeykens, B., Davenport, A., Castillo, S., Hansen, J., 1995. The adverse impact

of heavy episodic drinkers on other college students. J Stud Alcohol. 56, 628-634.

Zuckerman, M., Buchsbaum, M.S., Murphy, D.L., 1980. Sensation seeking and its biological

correlates. Psychol Bull. 88, 187-214.